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REPORT

OF

CONSTRUCTION PROGRESS ON INTER-AMERICAN HIGHWAY AND CURRENT STATUS OF THE PAN AMERICAN HIGHWAY SYSTEM, MEXICO TO PANAMA CANAL

TO THE

COMMITTEE ON PUBLIC WORKS
HOUSE OF REPRESENTATIVES

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REPORT OF CONSTRUCTION PROGRESS ON INTER-AMERICAN HIGHWAY

and

CURRENT STATUS OF THE PAN AMERICAN HIGHWAY SYSTEM, MEXICO TO PANAMA CANAL, 1958

Introduction

The Pan American Highway System in Mexico, built in its entirety with Mexico funds, begins at Nuevo Laredo, just across the Rio Grande from Laredo, Tex., or at Cuidad Juarez, just across the Rio Grande from El Paso, Tex.

From Nuevo Laredo the distance to Mexico City is 765 miles. This modern roadway is of asphalt construction and is kept in good condition. For some distance south of Nuevo Laredo elevations are not much above sea level but farther on the highway enters a mountainous region and in some places reaches an elevation of 8,000 feet. Mexico City is located in a great central plateau, at an altitude of 7,350 feet.

From Ciudad Juarez the distance to Mexico City is 1,315 miles; this is the Central Highway route. Long tangents, good curves, moderate grades and a wide surface make this an easy road to drive. From the west coast of the United States, Mexico City may be reached by the Pacific Highway which runs from Nogales, border city between Sonora and Arizona; this route is a little longer than the other highways (1,492 miles) but runs through many interesting towns and cities of Mexico. The newly paved highway from Piedras Negras through Eagle Pass, Tex., to Saltillo and Monterrey, provides an additional convenient road to Mexico City.

The road to Oaxaca, 340 miles south of Mexico City, climbs over a pass 10,500 feet high before it drops into the Puebla Valley; from the head of the valley the highway runs through a rough, mountainous desert. The distance from Oaxaca to San Cristobal, Mexico, is 387 miles over a well-paved road.

Although the road is passable at all times to the Mexico-Guatemala border, tourists will continue to experience very difficult motoring until the new Inter-American Highway route through Rio Selegua canyon is completed to Huehuetenango, Guatemala. From Huehuetenango through Guatemala City to the El Salvador border there is a combination of paved and all-weather roads.

The highways of El Salvador are among the best in Central America. From the Guatemala-El Salvador border to San Salvador (60 miles) the highway is of good asphalt construction and kept in good condition. This is true also of the remaining distance (130 miles) to the Honduras border.

Most of the highway across Honduras (94 miles) is surfaced with gravel or other hard material and may be traveled with ease. Teguci-

galpa, capital of Honduras, is reached by a 73-mile all-weather road branching from the Inter-American Highway at Jicaro Galan.

For a few miles after crossing the border into Nicaragua the road is similar to that on the Honduran side. From Sebaco to Managua, the capital, it is paved and kept in good condition. The distance from the Honduras border to Managua is 140 miles. The paved highway continues a distance of 68 miles to Rivas. From this point to the Nicaragua-Costa Rica border (22 miles) the road is good all-weather type construction.

South from the Nicaragua-Costa Rica border there is a modern all-weather road to San Ramon, a distance of 147 miles. From San Ramon to San Jose, the capital, and beyond to Cartago the road is paved (61 miles). From Cartago to San Isidro del General (71 miles) there is a good all-weather road. The major portion of this section between the two cities is in the mountains, but the highway is well planned with no special problems for the motorist even though the route climbs as high as 11,000 feet above sea level. The section from San Isidro del General to the town of Concepcion, in Panama, a distance of about 148 miles, is now under construction.

In Panama, the road from Concepcion to Panama City (301 miles) is open at all times. It is a low-level route with no bad grades. The section of the highway near the larger cities is of modern concrete pavement which is kept in good condition.

The following table gives a summary of the mileage of the Pan American Highway System in Mexico and Central America to the Panama Canal Zone:

	Total	Paved	All-weather	Impassable
Mexico [1]	1,603	1,603		
Guatemala	317	65	227	[2] 25
El Salvador	194	173	21	
Honduras [3]	166	16	150	
Nicaragua	229	131	98	
Costa Rica	412	61	218	133
Panama	540	75	264	
Total	3,461	2,124	978	158

[1] Distance from Ciudad Juarez to Mexico City is 1,315 miles (paved); remainder of mileage is beyond Mexico City in Mexico.
[2] Expected to be open to traffic by 1959.
[3] Includes branch to Tegucigalpa (73 miles of all-weather road), which is not part of the Inter-American Highway.

With these general comments on the Pan American Highway System in Mexico and that portion of the system in Central America usually referred to as the Inter-American Highway, we now proceed to a detailed statement with respect to the current status of the Inter-American Highway in Central America.

Inter-American Highway

In July 1955 when the accelerated construction program began on the 1,573-mile Inter-American Highway extending from the south border of Mexico to the Panama Canal, 569 miles were paved. This left 1,004 miles that required construction work of one type or another—920 miles of grading and drainage, 973 miles of base course, and 1,004 miles of paving. By July 1956 only one country, El Salvador,

had its entire length of the Inter-American Highway completed with a paved surface.

As of June 1957 appropriations for the United States two-thirds share of construction on the Inter-American Highway were as follows:

Prior to 1950	$38,973,000
Public Law 911, 81st Cong	4,000,000
Public Law 188, 82d Cong	3,000,000
Public Law 495, 82d Cong	1,000,000
Public Law 195, 83d Cong	1,000,000
Public Law 471, 83d Cong	1,000,000
Public Law 663, 83d Cong	4,750,000
Public Law 121, 84th Cong	25,250,000
Public Law 219, 84th Cong	37,730,000
Fiscal year 1958 Department of Commerce Appropriation Act	12,000,000
Total	128,703,000

At this time 744 miles, or 74 percent, of the heretofore mentioned 1,004 miles are under construction, including 100 bridges and the impassable sections in Guatemala, Costa Rica, and Panama. Contracts are mainly for grading, drainage, and bridges; as of November 1957 construction remained to be authorized for 102 miles in Panama and 73 miles in Honduras. It is now planned to award contracts prior to July 1958 for 235 miles of base course in Guatemala, 94 miles in Honduras, 106 miles in Nicaragua, 71 miles in Costa Rica, and 102 miles in Panama.

With the exception of one 140-mile project in Costa Rica and a 10-mile project in Panama, present construction plans do not include final paved surface. This priority of construction and utilization of available funds is in accordance with the recommendations of the Sixth Pan American Highway Congress, that opening of impassable sections, improvement of the low standard sections, and permanent bridges have priority of construction, so as to permit all-weather travel over the entire length of the Inter-American Highway at the earliest practicable time. In view of this priority of funds, no additional paving is planned until all of the grading, drainage, and select surface construction, and all bridge work is completed. It is presently indicated that a limited amount of paving may be possible with funds now available.

In order to observe progress of construction and expenditure of funds on the Inter-American Highway and to note economic and travel developments incident to the building of the highway, members of the Committee on Public Works, on several occasions, have made inspection trips to Central America. Chairman George H. Fallon, of the Subcommittee on Roads, and committee members Clifford Davis, John J. Dempsey, John C. Kluczynski, T. A. Thompson, Iris Faircloth Blitch, Kenneth J. Gray, J. Harry McGregor, Hubert B. Scudder, and William C. Cramer have participated in such trips. Committee members have also participated in Central American highway conferences having a special interest in the completion of the Inter-American Highway.

Robert F. McConnell, minority counsel, Committee on Public Works, accompanied by the chief engineers of the United States Bureau of Public Roads resident in the various countries of Central America, made an inspection of the highway during the so-called rainy season, beginning on September 8 and ending on September 25, 1957.

This committee report is the result of these several inspections and

conferences and gives an account of the construction progress on the Inter-American Highway, along with observations with respect to automobile service stations and accommodation facilities for motorists along the route and notes on travel regulations encountered in travel through Central American countries.

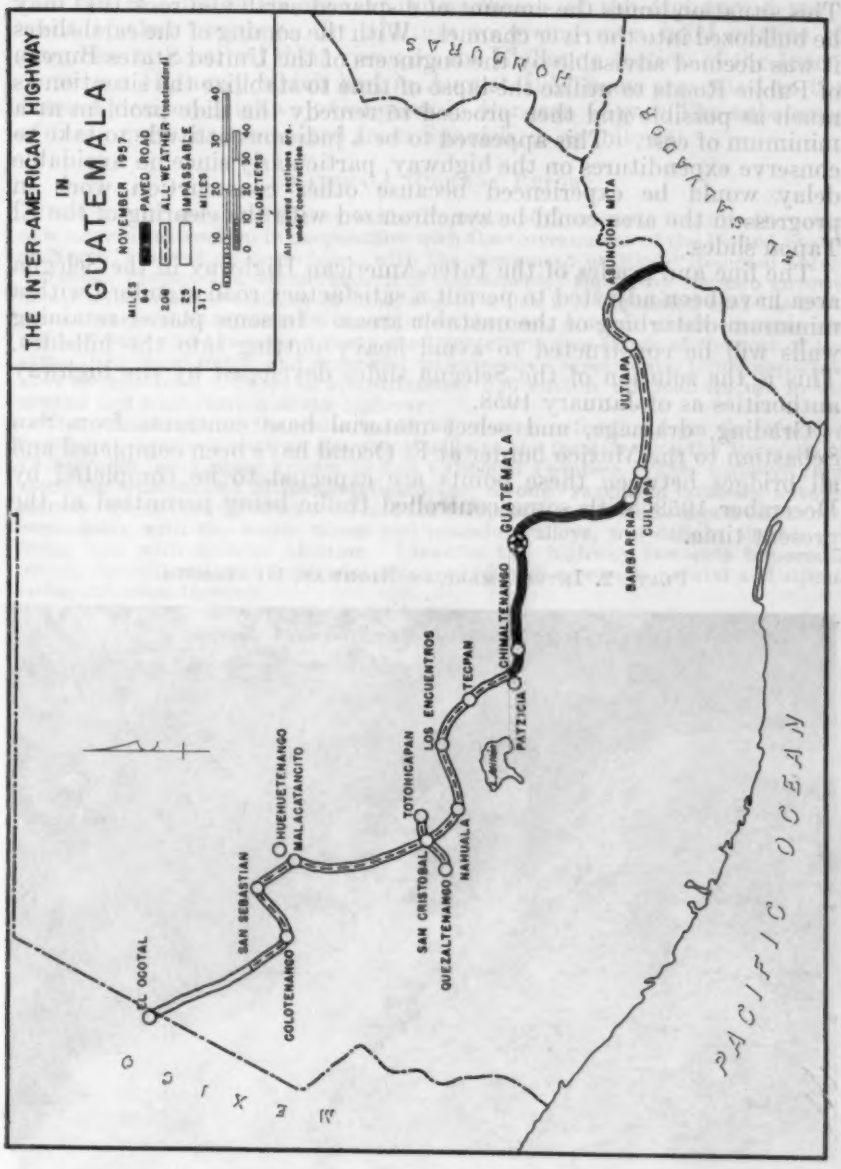
GUATEMALA

Travel from Washington, D. C., to Guatemala City was by air with arrival in the latter city at about 3 p. m., Monday, September 9. Early the following morning, in company with Mr. Thomas A. Jones, chief engineer for the United States Bureau of Public Roads, Huehuetenango, Guatemala, was reached via Aviateca Airlines. From Huehuetenango we traveled by motor car in the direction of the south border of Mexico along the route of current construction and the most northerly point reached was the El Tapon section (Rio Selegua Canyon) where extensive earth slides had been experienced.

PLATE 1. INTER-AMERICAN HIGHWAY, GUATEMALA

El Tapon: View of 1957 construction work in Selegua River Canyon

Earth slides have been confined substantially to project 16, a section of 18.3 miles extending from the southern Mexico border, under a Thompson-Cornwall, Inc., contract for grading, drainage, select material base, and construction of Selegua bridges No. 3 and No. 4, and projects 15 and 15A, an adjoining section of 6.8 miles extending from a point 25 miles north of Huehuetenango to the south limit of project 16, under a Fisher Contracting Co. contract for grading, drainage, and slide removal. However, some slides were experienced in project 17, a section of 44.2 miles with Huehuetenango located at approximately the midpoint, under an Oceanic Constructors, Inc., contract for grading, drainage, select material base and construction of one bridge.


THE INTER-AMERICAN HIGHWAY
IN
GUATEMALA
NOVEMBER 1957
MILES
64 PAVED ROAD
206 ALL WEATHER (intermittent)
29 IMPASSABLE
317
MILES
KILOMETERS
All unpaved sections are under construction
HONDURAS
EL SALVADOR
ASUNCION MITA
JUTIAPA
BARBARENA
CUILAPA
GUATEMALA
CHIMALTENANGO
PATZICIA
TECPAN
LOS ENCUENTROS
TOTONICAPAN
SAN CRISTOBAL
QUEZALTENANGO
NAHUALA
HUEHUETENANGO
MALACATANCITO
SAN SEBASTIAN
COLOTENANGO
EL OCOTAL
MEXICO
PACIFIC OCEAN

Road construction is difficult in most of projects 15, 16, and 17, particularly in the Rio Selegua Canyon. This river carries during the rainy season a large volume of water, heavily laden with silt, from the mountains and the rate of flow is torrential in a restricted riverbed. This situation limits the amount of displaced earth and rock that may be bulldozed into the river channel. With the coming of the earthslides it was deemed advisable by the engineers of the United States Bureau of Public Roads to utilize the lapse of time to stabilize the situation as much as possible and then proceed to remedy the slide problem at a minimum of cost. This appeared to be a judicious attitude to take to conserve expenditures on the highway, particularly since no avoidable delay would be experienced because other construction work in progress in the area could be synchronized with the clearing of the El Tapon slides.

The line and grades of the Inter-American Highway in the Selegua area have been adjusted to permit a satisfactory road standard with a minimum disturbing of the unstable areas. In some places, retaining walls will be constructed to avoid heavy cutting into the hillsides. This is the solution of the Selegua slides developed by the highway authorities as of January 1958.

Grading, drainage, and select material base contracts from San Sebastian to the Mexico border at El Ocotal have been completed and all bridges between these points are expected to be completed by December 1958, with some controlled traffic being permitted at the present time.

PLATE 2. INTER-AMERICAN HIGHWAY, GUATEMALA

View of 1957 road work in rugged Selegua River Canyon.

From San Sebastian to Patzicia, where pavement now begins, all grading, drainage, and select material base contracts are expected to be completed by June 1958; all bridges will be under contract by June 1958 and should be completed by June 1959.

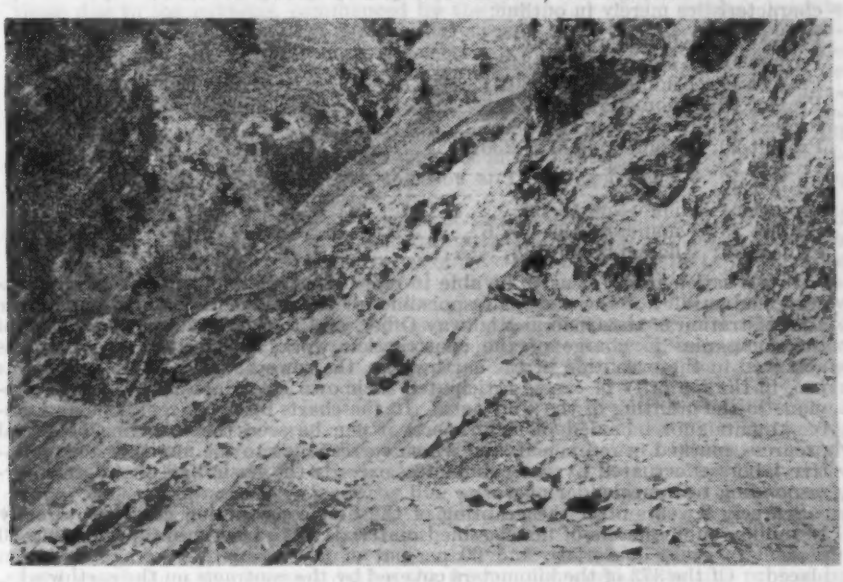
While in Guatemala we met with officials of the highway department of that country. In addition to giving us a brief outline of progress, we received their views on the El Tapon section of the Inter-American Highway which had in August 1957 been presented to the Inter-American Highway Congress in Panama City. The substance of this report, as translated from Spanish, is as follows:

GUATEMALA HIGHWAY REPORT

The Inter-American Highway in the Republic of Guatemala includes the route now under construction in cooperation with the Government of the United States of North America, in accordance with the agreement entitled "Regional Inter-American Project and Memorandum of Agreement," signed by the two governments under date of October 6, 1954, and in which it is stipulated that the first-named party shall contribute one-third of the cost, plus all which concerns the right-of-way; and the second party shall contribute two-thirds of the cost of the same. On these bases, and according to successive agreements, funds appropriated to date total a figure of approximately $26 million, destined for use in the studies and construction of the highway.

The total length of the route is 508 kilometers, extending from the Mexican frontier at a place known as Rancho Mesilla to the frontier with the Republic of El Salvador, at a place known as San Cristobal Frontera. This highway runs along the Guatemalan Altiplano (Highlands), through regions of imposing natural scenery, which because of its color and the perspective of its well-shaped volcanoes, contrasting with the rustic ridges and peaceful valleys, will delight the tourist filling him with esthetic emotion. Likewise this highway connects important urban, agricultural, and industrial zones, which will receive beneficial and stimulating influence thereby.

PLATE 3. INTER-AMERICAN HIGHWAY, GUATEMALA



Bulldozer at work, 1957, project 17.

The labors on the highway which had been completely abandoned during the administration of Colonel Arbenz, leaving the already constructed portions exposed to ruin and deterioration, were recommenced with a new and vigorous impulse under the auspices of the new Government of the Liberation, which with clearsightedness as to the historical and human importance which the construction of such an important highway represents for the future of America, did not restrict its efforts to convert into a reality the link corresponding to it in the "great highway ribbon," a secular dream of the people of the entire continent, which will strengthen the ideal of hemispheric solidarity.

And so it was that Guatemala, harmonizing its lofty patriotic ideals with the ambitions of the other American Republics, offered its material and human resources to the service of such a magnificant labor.

In the face of the urgency to open the route to international traffic, a constructive policy of the highest efficiency was necessary, possible only in a country of democratic character, by calling on the resources of private initiative; and in such manner the labors which must be accomplished were planned through contracts with construction companies or entities whose technical experience and financial circumstances constituted full guaranty for the execution of the work. The task of organizing and coordinating the complex labyrinth of operations required by such a great engineering job was quite difficult, due to the scarcity of engineers and technicians in this country, a result of the era of economic recuperation which was in force, principally felt in the construction field which has immediately absorbed all of the available specialized personnel. Overcoming all kinds of difficulties and in constant battle with the pressure of time, by April 1956, the sections of planning, drafting, and zoning of the 375 kilometers lacking in the highway were organized. All necessary technical documentation having been compiled, all parts of the construction were opened to auction, in accordance with the laws of the country, permitting bids for such events only from those companies of recognized prestige and financial solvency. In this manner, 11 contracts for the construction of earth works were granted to those making the lowest bids and in addition fulfilled all the requirements set forth in the bases for bidding.

Fifteen million cubic meters of unclassified materials, the placing of 50 kilometers of corrugated iron tubing with asphalt covering, of various diameters, and several other items comprised the 11 contracts granted to the companies, with an approximate value of 20 million quetzales, as described below, with their characteristics merely in outline:

Project 15: Kilometers 302–312	Fisher Co.
Project 16: Kilometers 312–342	Thompson-Cornwall Co.
Project 17: Kilometers 230–302	Oceanic Co.
Project 18: Kilometers 60–120	Thompson-Cornwall Co.
Project 19: Kilometers 120–187.5	Do.
Project 20: Kilometers 187.5–230	Fisher Co.
Project 21: 3 bridges	Icongua Co.
Project 22: 4 bridges	Panamericana Co.
Project 24: Kilometers 59–66	Do.
Project 25: Kilometers 135–147.6	Do.
Project 26: Kilometers 66–135	Do.

It is a satisfaction for us to be able to report that, thanks to the zeal and outstanding activity of the persons responsible for the engineering works and to the administration of the General Highway Office, and to the effective cooperation of the companies in charge of the construction works themselves, the progress achieved in the execution of the earthworks, the sewers and other related items has, in the majority of cases, anticipated their own calendars of work, fixed previous to the granting of the contracts. In the charts on earth removals and embankments (not included in this report) it can be seen that the line of actual progress, marked in red pencil, and which corresponds to the monthly accumulative labors effectuated by the companies, exceeds the basic line of progress corresponding to the calendar of work.

Scarcely 2 years after the granting of the first construction contract, already 16 million cubic meters of nonclassified materials have been moved, including 30 percent of rocky materials, and 60 percent of the estimate sewerage has been placed. Of the 373 of the kilometers covered by the contracts on the earthworks, 100 kilometers have been completed; 150 more are about 60 percent completed; another 50 kilometers have progressed up to 40 percent; 50 kilometers have only an approach opening, and the remainder, or some 20 kilometers are yet untouched.

All of the projects under construction have suffered a noticeable increase in the amounts originally estimated, principally in the items corresponding to unclassified excavation. This increase is generally due to having encountered unforeseen physical conditions in the constitution of the layers forming the subsoil of the uplands, which for the major part are composed of clay, lime, or volcanic ash materials, with high coefficients of contraction and shrinkage which altered the diagrams of ground structure, compelling a borrowing where the estimate had foreseen an equivalent between the excavated material and that to be used for fill-in.

The numerous cave-ins and slides which have occurred, making it necessary to remove the matter before continuing with the operations of the earthworks, contributed more than any other factor to the increase in costs, principally in projects 15, 16, 17, and 20, where the nature of the soil is such that the cut banks, even with slopes of 1:1 become unstable when reached by rainwater which had filtered down, occasioning the above-mentioned slides. In order to eliminate in the future the danger represented by the water-bearnig strata which abound in critical zones of the highway, interception has been installed by means of a French-type drainage, which has increased the estimated costs in these items.

From the experiences encountered in those works completed to date, we may deduce with some approximation that the increase in the unclassified excavations along the entire highway will be 30 to 40 percent higher than the original estimates, that is, in order to complete all the labor on the earthworks we would have to remove 20 or 21 million cubic meters instead of the 15 already contracted for, raising the figures originally contracted for to some 5 or 6 million quetzales more.

The section of the highway known internationally by the name of El Tapon, is found near the Mexican frontier, about 10 kilometers in size and situated in the canyon of the River Selegua. Originally the construction of this link was contracted for with the Fisher Construction Co., under date of May 2, 1956, the quantity of unclassified material to be removed being estimated at a million cubic meters which, in the final count made upon completion of the link on June 30 of last year, had risen to 1,800,000 cubic meters; in spite of the operations of the company, this section is in very bad condition for transit due to the numerous cave-ins resulting from the construction and the slides caused on the embankments by rising waters of the River Selegua during the last rainy season and the present one. The most serious problems presented in this link of the highway are those due to the cave-ins, commenced by the instability of the detrital deposits which form the steep slopes of the canyon, already in precarious unstable condition, a condition aggravated when the necessary cuts were made to open up the grading for the highway, disturbing the immobility of thousands of years of the mass with the seismic waves caused by the detonations of dynamite and the vibrations resulting from the labor of heavy machinery, all of which occasioned the appearance of cracks in the slopes, in some instances for distances greater than 200 meters in cut banks, through which rainwater filtered with great ease in the detrital deposits, breaking up the poor cohesion and causing friction of its particles, giving origin later to great slides.

Later on, there is a graphic illustration of this section (illustration not included in this report) showing the geological formations of the canyon slopes, in which can be seen the two most common types of cave-ins and slides, the type which we shall call avalanche, of rapid movement, and the settling type, of a slower movement. The former originates in those geological formations in which rocky materials are found on a rocky nucleus of precipitus stratus, over which the detrital covering matter is in precarious equilibrium; naturally any disturbance which alters said equilibrium causes a swift sliding of the detrital masses, starting avalanches of loose stone, sands and other elements. In the slides of slower movement, the geological constitution generally differs, in that the detrital masses lie on impermeable clay strata, on planes of little slope, so that when infiltrating waters reach the impermeable layers, they establish a plane of lubrication which facilitates the sliding of the entire mass onto the work of the highway. When the detrital mass is formed principally by lime substances, the presence of infiltrating waters causes the fluidity of the entire mass in a plastic state, destroying the cuts or slopes, and occasioning great disaster.

A calculation, off hand and fairly conservative, of materials fallen on this section because of slides as observed during the frequent inspections to this project by various engineers, raises the figures to more than a half million cubic meters.

At the present time, for the purpose of having this section completed by the middle of next year, intensive studies and topographic and aerophotographic measurements are being made in order to determine with close approximation

the amounts of material which must be removed, not only to clean up the bed of the highway from the slides, but also to cover the additional labors on the earthworks to avoid possible repetition of such slides which may endanger the traffic along the highway. At the same time studies are being made of accessory works to enable the taking of some critical steps for the mountainous topography of the section does not permit the construction of retention walls but compels the use of structures of special design or bridges to span the chasms.

For the coming month of November in which the dry season commences and in which any work of highway construction is possible, the necessary information to contract for all the labor and work in this difficult section of the Inter-American Highway, will be available.

Without any concrete figures available on the possible cost of the labors to be carried out in this section, an estimated conservative calculation indicates that immediately it will be necessary to invest a sum of 2½ million quetzales to cover the earthwork tasks, the construction of retention walls, bridges, cleaning up of slides and the carting away of the material from the slopes that offer potential and immediate danger in the form of slides.

We calculate that it will require a million quetzales more during the period of 4 years to effectuate all those operations of stabilizing the slopes, in order to obtain a section which will be completely safe and secure from all danger, and which may be used for transit at any time of the year.

Of the 44 bridges which are necessary to cross the corresponding watercourses, up to the present time the following have been constructed: 7 in the southwest section of the highway; 10 are in construction; 6 more are ready for construction contracts; and the remainder, that is 21, are still in the project stages, awaiting further construction contracts in the future.

The 6 or 7 structures of special design, needed for crossing on the link of El Tapon are not included, since these are not across watercourses as such, but over immense holes caved in from river erosion in the sides of the canyon over periods of time.

It is estimated that the total cost of all these structures will rise to probably the sum of 3 million quetzales.

It is possible that the asphalt works will be commenced during the next dry season, which begins in November, depending upon whether or not the Department of Commerce of the United States of North America, through the Bureau of Public Roads, assigns the corresponding funds, according to the regional Inter-American project and memorandum of agreement, to cover two-thirds of the estimated cost for the placing of a base of crushed stone and an asphalt sheet 5 centimeters in thickness, and whose cost for 375 kilometers is estimated at a total of 8 million quetzales.

The expenses incurred for the highway up to the 30th of June 1956, amount to 19,507,657.52 quetzales, it being estimated that in order to complete the earthworks and bridges, another 15,695,709.68 quetzales more will be needed, plus 8 million more, which is the estimate of the cost of the asphalt works on the 375 kilometers of the route.

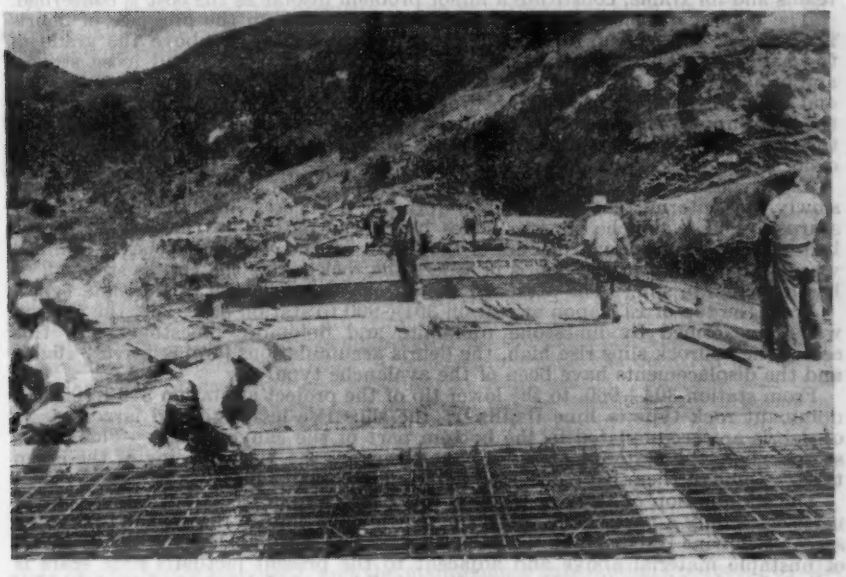
That is to say, the total cost estimated to put the highway into service from frontier to frontier rises to the sum of 43,203,367.20 quetzales, of which 14,401,122.40 quetzales correspond to Guatemala and $28,802,244.80 to the United States of North America.

As previously mentioned, the earth slides in the El Tapon area were matters of grave concern to all responsible for the construction of the Inter-American Highway in Guatemala, and, as a consequence, the problem was the subject of various engineering studies.

In addition to the report made by Senor Estrada Gomez of the Highway Department of the Republic of Guatemala, Edward B. Burwell, Jr., consulting geologist, was authorized by the engineering firm of Tippetts-Abbett-McCarthy-Stratton to make a study of the situation in the El Tapon section. At the conclusion of his study, he made on March 26, 1957, the following comments:

This report comprises the results of an examination of project 15 (El Tapon sector) of the Inter-American Highway in Guatemala, where construction has temporarily been interrupted because of slides. It also contains some comments on a brief inspection of project 16 of the highway, which extends from El Tapon to the Mexican border, and of the northern tip of project 17, between San Rafael and El Tapon.

PLATE 4. INTER-AMERICAN HIGHWAY, GUATEMALA



New bridge in course of construction in project 17 section; bridge has since been completed

The examination was made in the period March 15 to 17, 1957, in the company of Mr. A. V. Shelton, chief engineer of TAMS-Gibbs & Hill, and Mr. Thomas Jones, district engineer, of the United States Bureau of Public Roads. Engineers Estrada and Muñoz were present on the first day of the examination.

The primary purpose of the examination is to study and evaluate the conditions of the slides in project 15, which extends from station 301+900 to station 312+800 where more than 20 slides have taken place, some of them involving large quantities of material.

Project 15 begins approximately 20 kilometers northwest of the city of Huehuetenango and extends for 11 kilometers along the left wall of a deep canyon, known as El Tapon, which was cut by the river Selegua where it crosses a raised part of the Chuchumatanes. The local relief of the area is in the 2,000 meters above sea level category.

The construction of the highway has been extremely difficult, due to the prevailing sloping dips of bedrock, and the presence in the dips of the canyon of large accumulations of debris—deposits of detrital and colluvial talus which are apt to become displaced during the rainy season when their natural dips are oversteepened by the excavation work on the highway.

The River Selegua flows in a general direction of 20° north to 30° west through beds turned upward to lime and slate rock running 45° north and 60° west and dipping at steep angles (60°–80° southwest). Therefore the bedrock dips toward the interior of the canyon wall on the left bank, and toward the current of the right bank, of the river. Although this portion is favorable for the location of the highway on the left riverbank insofar as the bedrock displacements are concerned, the right riverbank or dipped slope has been less favorable because of the accumulation of debris, particularly where the bedrock is of limestone, and it appears that the going would not have been so tough if the so-called El Tapon sector had been located on that side. However, when one considers other factors such as the greater likelihood of rock slides on the right riverbank and the nature of the terrain to be traversed, there seems to be no clear advantage in favoring the location of the highway on the right riverbank.

The rocks which protruded from the surface in El Tapon were extensively broken up due to crumbling and shearing, and in some places, due to dislocations. Yet, they keep firm when cut into tali of ¼:1 except where there are adversely dipping shear planes or where protruding beds (bedrock) are left which cause

localized slips or small rockslides, which, though dangerous for the construction teams and for traffic, constitute a minor problem insofar as the cost is concerned.

The biggest displacement problems have resulted from the presence of debris in the lower 200 feet up to 800 feet of the canyon tali much above the grade of the highway. These deposits, which consist of detrital talus and loose stones, and of various soil types, occur as wedges resting in the slopes of more or less 1:1 and lying in the surfaces of the bedrock which generally rise above 1:1. When the base support is removed by the highway excavation and the saturation during the rainy season, the unsupported wedges above the cuts of the highway become dislocated.

Two types of slides have been recognized: the avalanche type which proceeds slowly, by intermittent movements, forming a succession of fissures and slip scarps. The avalanche slips or slides have occurred where the surface of the bedrock rises high above the cuts of the highway; the creep slides have occurred where the cuts are in the debris or where the rock above the cuts is stepped, or has a moderate slip. The attached sketch gives an example of the slide types.

From the top of El Tapon at station 301+900 to station 304+960, the canyon walls are formed by limestone (dolomite and dolomitic limestone). In this sector the bedrock slips rise high, the debris accumulations [are] relatively slight, and the displacements have been of the avalanche type.

From station 304+960, to the lower tip of the project at station 312+800, the dominant rock type is lime (lajilla [1]); the slips rise less high and large masses of debris are accumulated in the bottom part of the canyon walls. This is the sector where the majority of slides have occurred, the biggest being of the creep type. Some of them have occurred in old displacement masses.

The termination of the construction has been complicated by the fact that in most cases only a part of the wedges of debris have slipped during the first rainy season following [the beginning of] the construction work. Actually, the quantity of unstable material above and adjacent to the present [actual?] slide scars is believed to be bigger than the quantity of slide material removed to date plus the quantity remaining in the existing slides.

Approximately 800,000 cubic meters of material have been removed as a result of the condition of the slides, and a rough estimate, without the benefit of measurements, indicates that an additional quantity of between 500,000 and 800,000 cubic meters still remains to be removed in order to clean up and stabilize the existing slides.

The stabilization of the existing displacements or slides, and the removal of the masses of potential displacement in the wedges of debris above and adjacent to the existing slides, so as to provide a highway reasonably free from trouble for any season will involve, in the opinion of the undersigned, an additional excavation of at least 2 million cubic meters. To try to fill this under the existing conditions will be costly and dangerous, for much of the material is found above the slide scars in areas which are inaccessible to mechanical equipment. A more practical way of tackling the problem, in fact the only one acceptable, would be the removal of the potentially dangerous material in the cuts, and above them where the avalanche-type movements have been in evidence, and the adoption of a program for continuing the maintenance and supervision of El Tapon over a period of years in which new slides would occur and the unstable debris would be removed. To put this procedure into effect would probably necessitate a period of 5 years.

Messrs. Sorensen and Shelton and the undersigned conferred with the Minister of Communications and Public Works, Engineer Barrios Peña, with respect to the slide problems in El Tapon. When emphasis was placed on the importance of completing the highway within a short time, the Minister suggested the use of hydraulic methods to speed up the removal of the slides and to diminish the danger. To cope with avalanche-type slides, the consideration of such methods would be worthwhile. However, it does not appear that hydraulic methods could be applied to the bigger creep-type slides because the majority of them could be stabilized by leveling the slips by the use of mechanical equipment, thus eliminating the need for removing a large quantity of displaced material.

The attached table indicates the sites of the most important slides which have occurred in project 15, and an approximate visual estimate shows the quantity of material still remaining in the slides above the grade of the highway. The principal creep-type slides, which involve major proportions, occur between stations 306+940 and 307+240; 308+560 and 308+840; 308+940 and 309+120; and 309+180 and 309+540.

[1] Shale—translator.

These slides or slips can probably be stabilized by leveling the slips to 1½:1, beginning at the top of the slide mass.

It was suggested that the quantity of the removal of the slide material can be substantially reduced by a combination of raising the grade in some of the slide areas and deviating the roadbed toward the river. As these changes in alinement and grade would place a part of the roadbed on material of doubtful stability, it is deemed desirable to restore the original alinement and grade through the slide area.

A rough examination of project 16 between the El Tapon sector and the Mexican border, at present under construction by the Thompson-Cornwall Co., indicates that this sector will not be immune against slide problems of considerable magnitude when the rainy season arrives. Numerous cuts in the sector cross areas in which considerable quantities of overburden and slip debris occur in and above the taluses of the cuts. As the taluses of the prevailing cuts are ¼:1, regardless of the type of material, a number of slides can be anticipated. Similar conditions exist also in certain sectors of project 17, particularly in the vicinity of San Rafael, between stations 285+000 and 286+000, where there is a high bench below which strong deposits of overburden are lying immediately above the cuts of the road. The situation in this locality is aggravated by the irrigation and cultivation of sugar cane along the bench slip. A considerable slide has occurred at station 285+000, and others could occur during the rainy season. Slides of this type could be prevented or reduced to a minimum by the establishment of berms on the bedrock surface and by leveling the overburden slips to 1½:1, more or less.

Even when the physical conditions of El Tapon are such that many of the slides might have been prevented by merely removing the debris above the taluses of the cuts during construction, some of the major creep-type slides might have been prevented by the adoption of appropriate taluses for the properties, which are resistant against the soil and excessive rock zones encountered in the cuts, and by providing adequate drainage. It is held that this latter type of slide can be better stabilized, and the maintenance substantially reduced, by the installation of horizontal drainages along the toe of the taluses, and that they be equipped with perforated or notched tubing.

In the Guatemala Highlands area, due to the slides, much of our travel (September 1957) was along the old pioneer road built high in the Cuchumatanes range of mountains. This afforded an opportunity to view construction on the new route of the Inter-American Highway from the higher elevation pioneer road with its many valley panoramas. Travel along the pioneer road proved rather satisfactory because there was little motor traffic. This road goes through the highlands of Guatemala, a region sometimes termed the Switzerland of the North American Continent; it is limited in area, generally mountainous, highly scenic, and has a number of satisfactory hotels; it offers antiquities, native inhabitants dressed in an amazing variety of colorful handwoven costumes, bargains in native handicrafts, fiestas, and ancient traditions.

From a tourist standpoint the Huehuetenango area is of special interest because just outside of the city and a short distance off the Inter-American Highway are the Zaculeu Maya Indian ruins restored by an expedition sponsored by the United Fruit Co. Huehuetenango affords in Hotel Zaculeu very adequate accommodations for the tourist.

From Huehuetenango, where we spent the night of September 10, the new route of the Inter-American Highway goes south and east through San Cristobal, Nahuala, Los Encuentros, and Tecpan to Patzicia, where the first paved surface section of the Inter-American Highway is encountered in Guatemala. Our travel, as previously mentioned, from Huehuetenango to Guatemala City generally was by the old route in detour to avoid extremely muddy conditions prevailing in the rainy season, but where possible we traveled on sections in advanced stages of construction. Our route took us through Chichica-

stenango where we stopped for lunch at the Mayan Inn, an excellent hotel, and for a siesta-time visit with some Maya Indians in the famous market square of Chichicastenango and to observe the Maya Indian ceremonial on the steps of the old church.

When the Inter-American Highway is completed Chichicastenango will be a short distance off the new route. It is believed that this location of the new route will tend to preserve the antique character of the city of Chichicastenango. A similar comment may be made with respect to San Rafael; 20 miles north of Huehuetenango, high on a mountainside above the Selegua River, at an altitude of about 7,000 feet, stands this primitive Guatemala village. The planned bypass is intended to preserve the existing atmosphere of San Rafael from the tourist imprint likely to follow an increase in motor traffic.

From Chichicastenango the tourist will be prone to stray from the main highway route in order to view magnificent Lake Atitlan and its volcano-studded shoreline, the Maya village of Solola and the earthquake ruins of Antigua enroute to the capital city of Guatemala. Antigua was a city of nearly 70,000 in 1773, with 57 churches, 8 colleges including the University de San Carlos, and many substantially constructed public buildings, when it was destroyed by earthquake. It has very satisfactory accommodations in the Antigua, Posada Belem, Rancho Nimajay and other hotels. The area possesses enough of current interest and antiquity to justify a reasonable stopover. Good overnight accommodations also are available to those who wish to stay at Lake Atitlan.

We traveled from Huehuetenango to Patzicia, where current construction meets a paved section of the Inter-American Highway that extends through Guatemala City to Barbarena. In the Huehuetenango-Patzicia section roadwork proceeded under contracts as follows:

Project 20, under a Fisher Contracting Co. contract for 25.4 miles of grading, drainage, and select material base between San Francisco and Chiquivel.

Project 19, under a Thompson-Cornwall, Inc., contract for 37.5 miles of grading, drainage, and select material base from Los Encuentros to San Cristobal, and project 19 extension for 4.7 miles of grading, drainage, and select material base from San Cristobal to San Francisco.

Project 18, under a Thompson-Cornwall, Inc., contract for 38.9 miles of grading, drainage, and select material base from Patzicia to Los Encuentros.

The existing paved surface segment of the Inter-American Highway between the Huehuetenango-Patzicia and the Barbarena-Asuncion Mita construction sections is 72 miles in length and the highway department of the Republic of Guatemala has a well-developed organization for Inter-American and other highway maintenance.

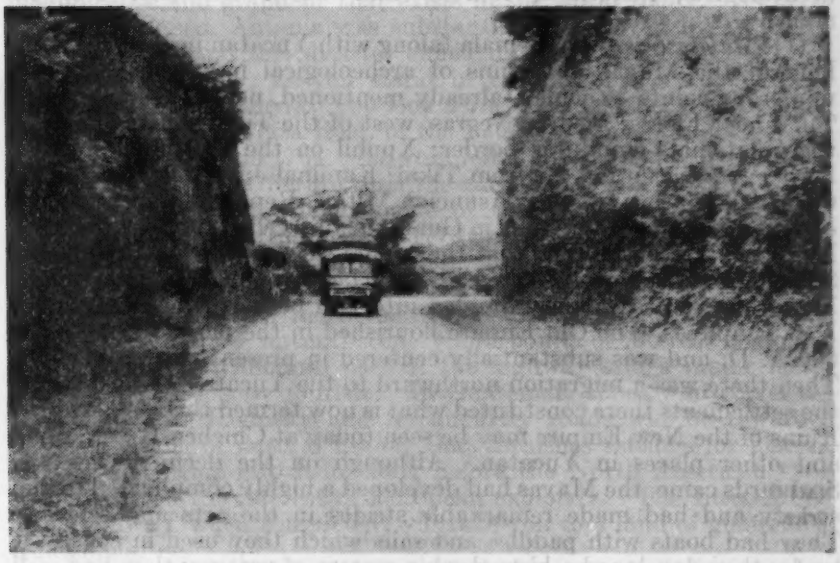
On September 13 we drove from Guatemala City on the paved section of the Inter-American Highway to Barbarena to view progress of construction from that point to Asuncion Mita. In the Barbarena-Asuncion Mita sector work was in progress under contracts as follows:

Project 21, under a Compania Incongua contract for the construction of the Agua Estancada, Moran, and La Virgen Bridges between Acatempa and Asuncion Mita.

Project 22, under a Compania Pan Americana contract for the construction of the Las Vinas, Los Esclavos, San Antonio, and Los Pozas bridges between Rebanales and Asuncion Mita.

Plate 5

INTER-AMERICAN HIGHWAY, GUATEMALA



Steep highway cut in Guatemala, near Conche; note heavy cover growth, 2 years old, on sides of cut.

At this point we wish to mention that there is a bridge of historic interest, Puente Rio Esclavos, at Cuilapa. This bridge was completed in 1592, just 100 years after Columbus discovered America, and it is probably the oldest bridge serving a principal highway in the Western Hemisphere. Project 22 works call for the construction of a new bridge within sight of the old one which will be preserved as a national monument.

Project 24, under a Compania Pan Americana contract for 7.5 miles of grading, drainage, and select material base from Barbarena to Los Esclavos.

Project 26, under a Compania Pan Americana contract for 42.2 miles of grading, drainage, and select material base from Los Esclavos to Quevara.

Project 25, under a Compania Pan Americana contract for 7.8 miles of grading, drainage, and select material base from Quevara to Asuncion Mita.

In the Barbarena-Asuncion Mita section all grading, drainage, and select material base contracts are to be completed by June 1958 and all bridge construction should be finished by the end of 1958.

A paved surface segment connects Asuncion Mita, Guatemala, with the all-paved Inter-American Highway through El Salvador. All Guatemala road construction contracts put a total of 233.3 miles of grading, drainage and select material base in progress.

Today there is travel over the entire length of the Inter-American Highway in Guatemala, except for 7 miles in El Tapon of the Selegua River Canyon section.

The importance of the Inter-American Highway stands out strongly when it is pointed out that Guatemala holds much of interest to archeologists, historians, tourists and world travelers. For instance—

(1) *Maya ruins.*—Guatemala (along with Yucatan in Mexico) is the land of the Mayas and ruins of archeological importance exist at numerous points—Zaculeu, already mentioned, near Huehuetenango; Tikal near Flores; Piedras Negras, west of the Tikal ruins; Copan on the Guatemala-Honduras border; Xpuhil on the Guatemala-Mexico border; Uaxactun not far from Tikal; Kaminal Juyu near Guatemala City; and another site near Asuncion Mita. Reports by archeologists indicate that the Maya ruins in Guatemala preceded those in Yucatan, Mexico. About the time that the Moors were setting out to conquer Spain, great Maya cities had already been founded in Guatemala. Maya history is generally divided into two periods, the Old and the New Empires. The Old Empire flourished in the period from 400 to 600 A. D. and was substantially centered in present-day Guatemala. Then there was a migration northward to the Yucatan Peninsula and the settlements there constituted what is now termed the New Empire. Ruins of the New Empire may be seen today at Chichen Itza, Uxmal, and other places in Yucatan. Although on the decline when the Spaniards came, the Mayas had developed a highly complicated feudal society and had made remarkable strides in the arts and sciences. They had boats with paddles and sails which they used in coastwise trade; they developed a hieroglyphic system of writing; they had well advanced systems of mathematics and astronomy, including a calendar more accurate than that used in Europe at the time America was discovered.

(2) *Maya culture.*—In the Lake Atitlan, Solola, Quiche and other areas the Maya Indians still wear their own distinctive tribal costumes and offer for sale their handicraft products, including Mayan design handwoven textiles much desired for dresses, and other articles of wearing apparel.

(3) *Lake Atitlan.*—Lake Atitlan must be considered one of the most beautiful lakes in the world. It is 24 miles long, 10 miles wide, and estimated to be between 1,500 and 1,700 feet deep, a depth comparable to that of Lake Superior.

(4) *Volcanoes.*—Guatemala has 33 volcanoes, many still active, including Atitlan (11,564 feet), Acatenango (12,952 feet), Agua (13,310 feet), San Pedro (9,920 feet), Toliman (10,750 feet), and Fuego clustered in the Lake Atitlan-Antigua area. Santa Maria volcano is located near Quetzaltenango and others dominate the landscape in the vicinity of Lake Amatitlan, about 17 miles southwest of Guatemala City. Water in Lake Amatitlan adjacent to the volcanic mountains is hot, while water in the other side of the lake is cold. Near the village of Amatitlan and the lake is the recently established Park of the Americas.

(5) *Antigua.*—The city of Antigua, southwest of Guatemala City, is known as the Mother City of Guatemala and is the former capital of the Republic. The city was founded in 1543 in the shadow of Volcano Agua; by 1700 it had attained a population of 70,000; its edifices included 57 churches and 18 convents; the Palace of the Captains General and other magnificent public buildings; 5 hospitals; and the University of San Carlos (now a museum) and 7 other institutions of higher learning. The city was amply supplied by water from

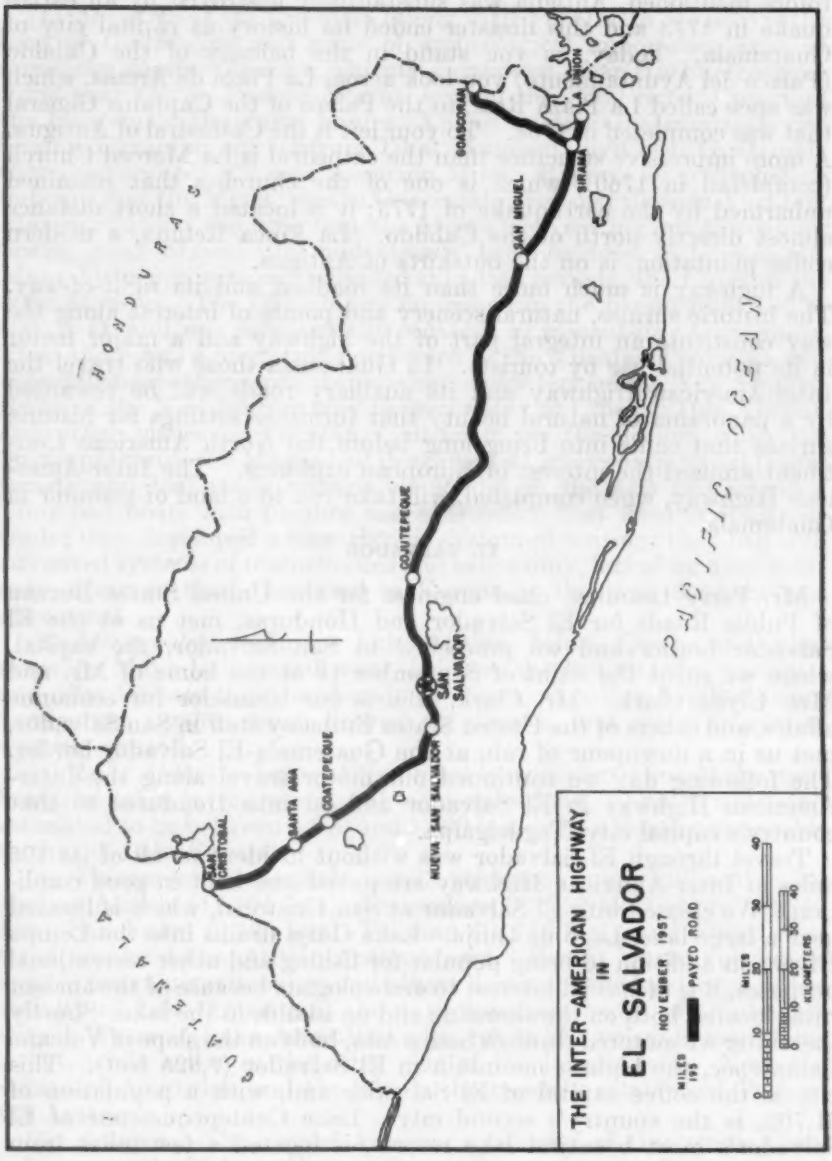
the mountains via 3 aqueducts and there were 25 public fountains. It is termed the most impressive monument of Spanish colonial magnificence and grandeur that exists in the world today. As heretofore mentioned, Antigua was substantially destroyed by an earthquake in 1773 and this disaster ended its history as capital city of Guatemala. Today, as you stand in the balcony of the Cabildo (Palace del Ayuntamiento) you look across La Plaza de Armas, which was once called La Plaza Real, to the Palace of the Captains General that was completed in 1764. To your left is the Cathedral of Antigua. A more impressive structure than the cathedral is La Merced Church (completed in 1760), which is one of the churches that remained unharmed by the earthquake of 1773; it is located a short distance almost directly north of the Cabildo. La Finca Retana, a modern coffee plantation, is on the outskirts of Antigua.

A highway is much more than its roadbed and its right-of-way. The historic shrines, natural scenery and points of interest along the way constitute an integral part of the highway and a major factor in its potential use by tourists. In Guatemala those who travel the Inter-American Highway and its auxiliary roads will be rewarded by a panorama of natural beauty that furnishes settings for historic shrines that came into being long before the North American Continent aroused the interest of European explorers. The Inter-American Highway, when completed, will take you to a land of glamour in Guatemala.

EL SALVADOR

Mr. Perry Leaming, chief engineer for the United States Bureau of Public Roads for El Salvador and Honduras, met us at the El Salvador border and we proceeded to San Salvador, the capital, where we spent the night of September 13 at the home of Mr. and Mrs. Clyde Clark. Mr. Clark, who is our counselor for economic affairs, and others of the United States Embassy staff in San Salvador, met us in a downpour of rain at the Guatemala-El Salvador border. The following day we continued our motor travel along the Inter-American Highway in El Salvador and on into Honduras to that country's capital city, Tegucigalpa.

Travel through El Salvador was without incident as all of its 195 miles of Inter-American Highway are paved and kept in good condition. We crossed into El Salvador at San Cristobal, which is located near a large lake, Lago de Guija. Lake Guija drains into the Lempa River; in addition to being popular for fishing and other recreational purposes, it is of special interest to archeologists because of the ancient ruins located both on the shoreline and on islands in the lake. Shortly thereafter we motored through Santa Ana, built on the slope of Volcano Lamatepec, the highest mountain in El Salvador (7,825 feet). This city is the coffee capital of El Salvador and, with a population of 51,702, is the country's second city. Lake Coatepeque, one of El Salvador's most beautiful lake resorts, is located a few miles from Santa Ana or Coatepeque. Lake Coatepeque, whose name means "Eye of the Sea," is a lake without an outlet. Smaller than Lake Ilopango and more rustic, it is completely hemmed in by wooded hills. A favorite weekend resort, its shores are lined with hotels and private cottages, and it has very good facilities for bathing, fishing, and sailing. Famous for its beauty and its mineral waters, the lake has been termed "The Vichy of Central America."


HONDURAS
GUATEMALA
PACIFIC OCEAN
SAN CRISTOBAL
SANTA ANA
COATEPEQUE
NUEVA SAN SALVADOR
SAN SALVADOR
COJUTEPEQUE
SAN MIGUEL
SIRAMA
LA UNION
GOASCORAN
THE INTER-AMERICAN HIGHWAY
IN
EL SALVADOR
NOVEMBER 1957
PAVED ROAD
MILES
KILOMETERS

En route to San Salvador we passed through Santa Tecla or Nueva San Salvador where the laboratories of the El Salvador Coffee Growers Association and the Centro Nacional de Agronomia (agricultural school) are located.

PLATE 6. INTER-AMERICAN HIGHWAY, EL SALVADOR.

Wheelbarrow and shovel maintenance work on the highway en El Salvador. All of the Inter-American Highway mileage in El Salvador is completed.

San Salvador is in the shadow of Volcano San Salvador (6,333 feet) and was damaged by an earthquake in 1917. The general appearance of the city is pleasing and the surrounding mountainous landscape adds to the grandeur of the capital. Near San Salvador, at San Andres Hacienda, are newly discovered Maya ruins. About midway between San Salvador and Cojutepeque lies El Salvador's famous and magnificent volcanic crater lake—Lake Ilopango, with beautiful Parque Apulo on its shores.

East of San Salvador we passed through Cojutepeque, which was twice the national capital city of El Salvador. Our next point of interest was the city of San Vicente (population 10,950), which is located at the foot of the Volcano Chinchontepec (7,000 feet). There is another lake, Lake Apastepeque, near San Vicente, which is well developed for recreational purposes. The outstanding characteristic of the coastal range of El Salvador is its volcanoes, the peaks of which overlook the Pacific Ocean. Volcano Izalco (6,300 feet) is still active.

Farther east we passed through San Miguel, traveling for some distance within the shadow and under the smoke blanket of Volcano San Miguel. San Miguel is the center of the sisal or henequen industry of El Salvador and has a population of 26,702. Near San Miguel we stopped along the highway to look at extensive fields of cotton being grown under a modern farming program. The cotton

stand was excellent and the plants were being sprayed for insect control by low-flying planes especially equipped for this work.

The Inter-American Highway is paved, as previously mentioned, and was completed in 1956. Its construction included the Cuscatlan Bridge to cross the Lempa River; this bridge (1,350 feet overall) is the longest suspension bridge in Central America.

We continued our motor travel along the Inter-American Highway through Goascoran into Honduras.

HONDURAS

Upon reaching Jicaro Galan, Honduras, on the Inter-American Highway, we turned into the Tegucigalpa Road and arrived in Tegucigalpa late the afternoon of September 14. The following morning we retraced our travel route back to the Inter-American Highway at the Jicaro Galan junction.

Tegucigalpa is situated at the foot of the mountain El Picacho on a plateau about 3,200 feet above sea level where the climate is pleasant and mild. (The same type of climate also prevails in the city of San Salvador, the capital city of El Salvador.) The city was founded in the 16th century and the nearby silver and gold mines soon made it the leading city of Honduras.

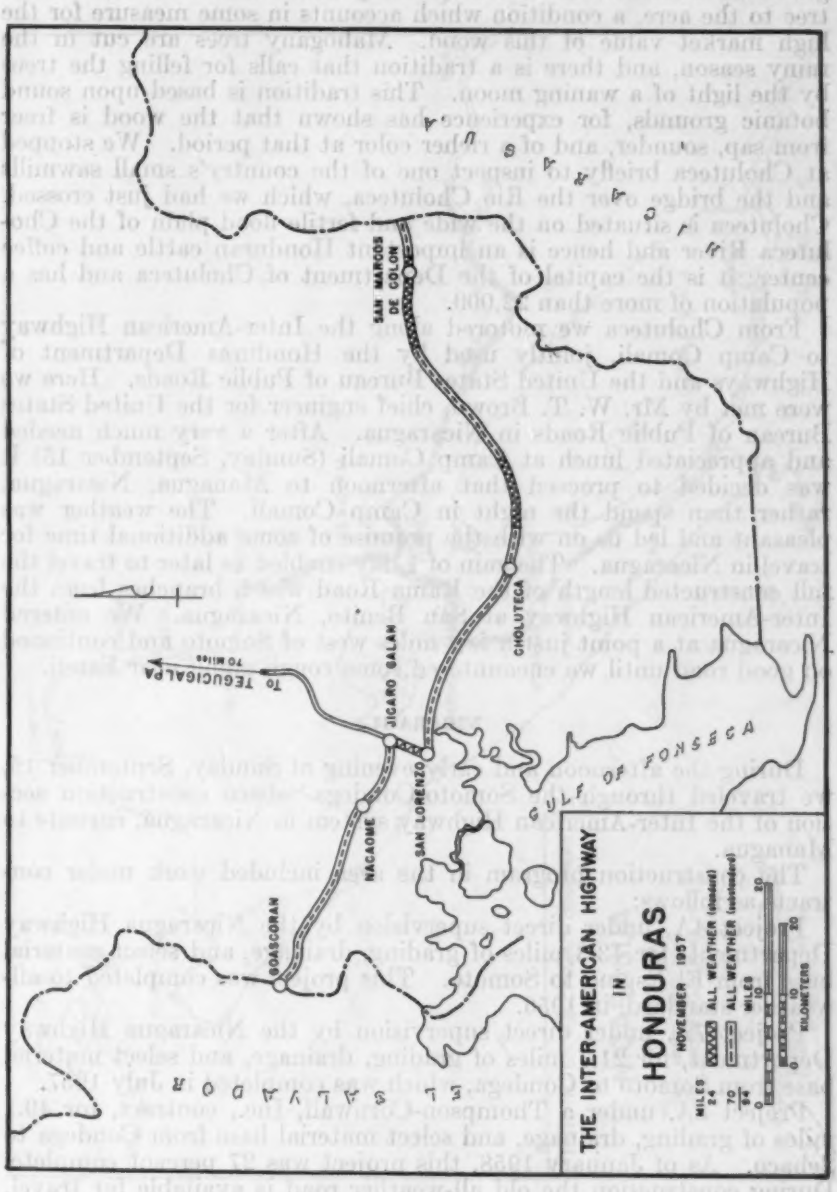
In 1824 the first Honduran government decreed that the seat of government should alternate between Comayagua and Tegucigalpa and this situation continued until 1880 when Tegucigalpa was chosen the permanent capital. Up until 1898 Tegucigalpa and Comayagua, the smaller community separated from Tegucigalpa by the Choluteca River, existed as two towns; now both are part of a single entity known as the Central District.

Tegucigalpa, like all other Central American cities, has its central square, Parque Morazon, named after the national hero of Honduras. Grouped around this square are the cathedral, the Palace of the Central District, and the National Museum. The Presidential Palace is a most imposing structure located on the bank of the Choluteca River. The National University and the National School of Fine Arts are in the Comayaguela section.

From Jicaro Galan we proceeded to San Lorenzo, which is located on the Gulf of Fonseca. San Lorenzo affords a sheltered port but its maximum utility is reached only during periods of high tide. Completion of the Inter-American Highway will undoubtedly have a profound economic effect on this port and the surrounding area.

As previously mentioned, most of the 94 miles of Inter-American Highway in Honduras is all-weather and kept in good condition; as a consequence only a limited mileage was under construction contracts, as follows: Project 56–1, under an F. & C. Drake contract for 21.2 miles of grading, drainage, and select material base, from Jicaro Galan to El Espino, and project 56–1B, under a Stupp Bros. Bridge & Iron Co. contract for the construction of 5 bridges.

In Honduras everything has now been let to contract up to the paving stage. The project 56–1A, San Lorenzo to the Nicaragua border, contract has been awarded to Thompson-Cornwall, Inc.; this contract includes 16 bridges, drainage, grading, and special subbase. This will complete the highway in Honduras to Inter-American standards and will leave only the bituminous paving to be let to contract in 1959 if enough funds are available.


GUATEMALA
SAN MARCOS DE COLON
CHOLUTECA
TO TEGUCIGALPA
70 MILES
JICARO GALAN
SAN LORENZO
GULF OF FONSECA
NACAOME
GOASCORAN
EL SALVADOR
THE INTER-AMERICAN HIGHWAY
IN
HONDURAS
NOVEMBER 1957
ALL WEATHER (standard)
ALL WEATHER (substandard)
MILES
KILOMETERS

An important source of wealth in Honduras is found in the forests where mahogany, cedar, pine, and other woods grow. Mahogany grows in isolation, there rarely being more than one marketable tree to the acre, a condition which accounts in some measure for the high market value of this wood. Mahogany trees are cut in the rainy season, and there is a tradition that calls for felling the trees by the light of a waning moon. This tradition is based upon sound botanic grounds, for experience has shown that the wood is freer from sap, sounder, and of a richer color at that period. We stopped at Choluteca briefly to inspect one of the country's small sawmills and the bridge over the Rio Choluteca, which we had just crossed. Choluteca is situated on the wide and fertile flood plain of the Choluteca River and hence is an important Honduran cattle and coffee center; it is the capital of the Department of Choluteca and has a population of more than 22,000.

From Choluteca we motored along the Inter-American Highway to Camp Comali, jointly used by the Honduras Department of Highways and the United States Bureau of Public Roads. Here we were met by Mr. W. T. Brown, chief engineer for the United States Bureau of Public Roads in Nicaragua. After a very much needed and appreciated lunch at Camp Comali (Sunday, September 15) it was decided to proceed that afternoon to Managua, Nicaragua, rather than spend the night in Camp Comali. The weather was pleasant and led us on with the promise of some additional time for travel in Nicaragua. The gain of 1 day enabled us later to travel the full constructed length of the Rama Road which branches from the Inter-American Highway at San Benito, Nicaragua. We entered Nicaragua at a point just a few miles west of Somoto and continued on good road until we encountered some rough going near Esteli.

NICARAGUA

During the afternoon and early evening of Sunday, September 15, we traveled through the Somoto-Condega-Sebaco construction section of the Inter-American Highway system in Nicaragua, enroute to Managua.

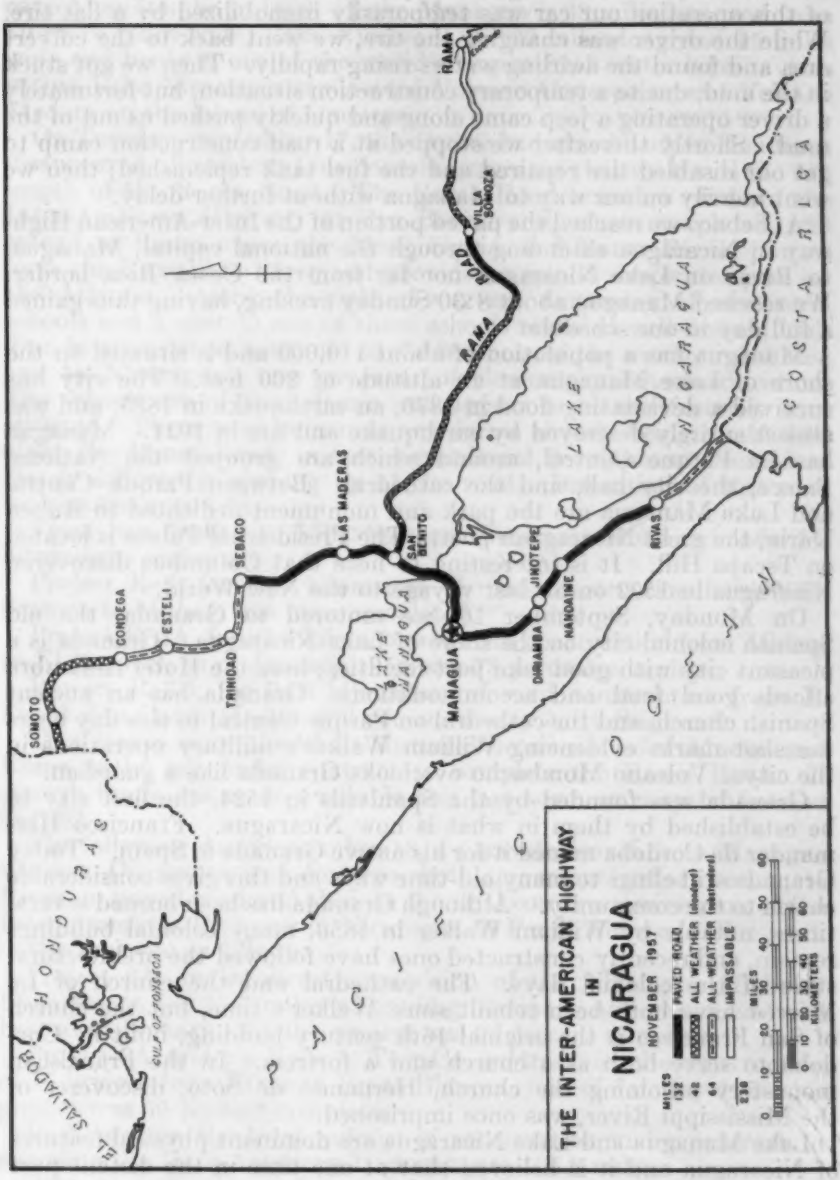
The construction program in the area included work under contracts as follows:

Project 4A, under direct supervision by the Nicaragua Highway Department, for 13.3 miles of grading, drainage, and select material base from El Espino to Somoto. This project was completed to all-weather standard, in 1956.

Project 7A, under direct supervision by the Nicaragua Highway Department, for 21.7 miles of grading, drainage, and select material base from Somoto to Condega, which was completed in July 1957.

Project 8A, under a Thompson-Cornwall, Inc., contract, for 49.1 miles of grading, drainage, and select material base from Condega to Sebaco. As of January 1958, this project was 27 percent complete. During construction the old all-weather road is available for travel, which is substandard with respect to alinement and grades.

Project 3A, under direct supervision by the Nicaragua Highway Department, for the construction of 17 bridges between El Espino and Sebaco. As of January 1958, this project was 99 percent complete.


RAMA
VILLA SOMOZA
ROAD
RAMA
LAKE NICARAGUA
COSTA RICA
LAS MADERAS
SEBACO
SAN BENITO
JINOTEPE
RIVAS
ESTELI
CONDEGA
TRINIDAD
DIRIAMBA
NANDAIME
MANAGUA
LAKE MANAGUA
SOMOTO
HONDURAS
EL SALVADOR
GULF OF FONSECA
THE INTER-AMERICAN HIGHWAY IN NICARAGUA
NOVEMBER 1957
PAVED ROAD
ALL WEATHER (standard)
ALL WEATHER (substandard)
IMPASSABLE
MILES
KILOMETERS

Travel along the route was without incident until we were in the vicinity of Esteli. We crossed an inadequate culvert on the old road with runoff troubles during a downpour of rain and during the course of this operation our car was temporarily immobilized by a flat tire. While the driver was changing the tire, we went back to the culvert area and found the swirling waters rising rapidly. Then we got stuck in the mud, due to a temporary construction situation, but fortunately a driver operating a jeep came along and quickly pushed us out of the mud. Shortly thereafter we stopped at a road construction camp to get our disabled tire repaired and the fuel tank replenished; then we went merrily on our way to Managua without further delay.

At Sebaco we reached the paved portion of the Inter-American Highway in Nicaragua extending through the national capital, Managua, to Rivas on Lake Nicaragua not far from the Costa Rica border. We reached Managua about 8:30 Sunday evening, having thus gained a full day in our schedule.

Managua has a population of about 110,000 and is situated on the shore of Lake Managua at an altitude of 200 feet. The city has survived a devastating flood in 1876, an earthquake in 1885, and was almost entirely destroyed by earthquake and fire in 1931. Managua has its Parque Central, around which are grouped the National Palace, the city hall, and the cathedral. Between Parque Central and Lake Managua are the park and monument dedicated to Ruben Dario, the great Nicaraguan poet. The Presidential Palace is located on Tscapa Hill. It is interesting to note that Columbus discovered Nicaragua in 1502 on his last voyage to the New World.

On Monday, September 16, we motored to Granada, the old Spanish colonial city on the shore of Lake Nicaragua. Granada is a pleasant city with good lake port facilities; here the Hotel Alhambra affords good food and accommodations. Granada has an ancient Spanish church, and the cathedral on Parque Central to this day bears the shot marks evidencing William Walker's military operations in the city. Volcano Mombacho overlooks Granada like a guardian.

Granada was founded by the Spaniards in 1524, the first city to be established by them in what is now Nicaragua. Francisco Hermandez de Cordoba named it for his native Granada in Spain. Today Granada still clings to many old-time ways and this gives considerable charm to the community. Although Granada has been burned several times, notably by William Walker in 1856, many colonial buildings remain, and recently constructed ones have followed the architectural style of the colonial days. The cathedral and the church of La Merced have both been rebuilt since Walker's time, but the church of San Francisco is the original 16th century building, built by Cordoba to serve both as a church and a fortress. In the Franciscan monastery adjoining the church, Hernando de Soto, discoverer of the Mississippi River, was once imprisoned.

Lake Managua and Lake Nicaragua are dominant physical features of Nicaragua and it is believed that at one time in the distant past that the two together formed part of an ocean bay; and that when a volcanic eruption closed the entrance, the bay became an inland basin embracing the two lakes connected by the Tipitapa River. This belief also gives support to the theory that this volcanic action trapped typical salt-water fish—swordfish, sharks, and tarpon—and the fish did the best they could under the circumstances and gradually adapted themselves to life in fresh water. Lake Nicaragua has the

distinction of being the only body of fresh water having sharks. The elevation of Lake Managua is 40 feet higher than that of Lake Nicaragua; the level of Lake Managua was raised by the eruption of Volcano Momotombo in 1609. Lake Managua is 38 miles long and from 10 to 16 miles wide; Lake Nicaragua is 100 miles long and 45 miles wide and hence is one of the world's largest fresh-water lakes. Also within Lake Nicaragua are located Volcano Concepcion and Volcano Madera on the Island of Ometepe.

On Tuesday, September 17, the day we had saved back in Honduras disappeared. President Luis Somoza suggested that we travel the full length of the Rama Road. The Rama Road branches off from the Inter-American Highway at San Benito and, when completed, will extend to Rama where the Mico, Siguia, and Rama Rivers join to form the Escondido River and provide an inland deepwater port on the Atlantic. Along the right-of-way are a number of new rural schools and a visit to one of these schools revealed well-dressed children in attendance, a tribute to the mothers of the nearby rural area and to Nicaragua's new program of elementary school education. The schools are of good design and appear to be satisfactorily constructed. There were numerous new farms already being established along the Rama Road; in fact, agricultural development seemed to closely follow the opening up of the road. Inspection of this road took us the entire day.

From San Benito to Villa Somoza the Rama Road is ready for bituminous surfacing.

Project R–3, for 19.6 kilometers of road construction from Villa Somoza to Muhan, has been completed.

Project R–3A, for 23.8 kilometers of road construction from Muhan to El Espabel, as of January 1958 was 78 percent complete.

Project R–3B, for 24.3 kilometers of road construction from El Espabel to Cedro Macho, will get under way early this year.

This leaves only the short distance between Cedro Macho and Rama to be put under contract to complete the Rama Road. If enough funds are made available this last segment may be finished in 1959.

The following day, September 18, we traveled south from Managua through Diriambra and Jinotepe, both important coffee centers, to Rivas on paved road and then on the final construction section of the Inter-American Highway in Nicaragua to Penas Blancas. The work in this area was as follows:

Project 6A, under direct supervision of the Nicaragua Highway Department for 21.7 miles of grading, drainage and select material base as of January 1958 this project was 24 percent complete.

Project 5A, under a Nello L. Teer Co. contract, for the construction of 10 bridges from Rivas to Penas Blancas. As of January 1958 this project was 56 percent complete.

In Nicaragua the total mileage of construction under contract to complete the Inter-American Highway was 105.8 miles.

Rivas was the scene of stormy battles in the war precipitated by the American adventurer, William Walker, and witnessed his final capitulation to a coalition of Central American forces in 1857. He was later executed in Honduras, but not before he had, in 1856, made himself President of Nicaragua.

When we reached the Nicaragua-Costa Rica border near Penas Blancas we were met by Mr. Marvin L. Harschberger, chief engineer

for the United States Bureau of Public Roads in Costa Rica and long identified with work on the Inter-American Highway in Central America.

COSTA RICA

The first 148 miles of the Inter-American Highway in Costa Rica, from the Nicaragua border to San Ramon, are included in a construction program, as follows:

Projects 3A and 3B, under Empresa Constructora and Rafael Herrera, Ltd., contracts for 148 miles of grading, drainage, and bituminous surfacing between the Nicaragua border and San Ramon; and the construction of 28 bridges in the contract section.

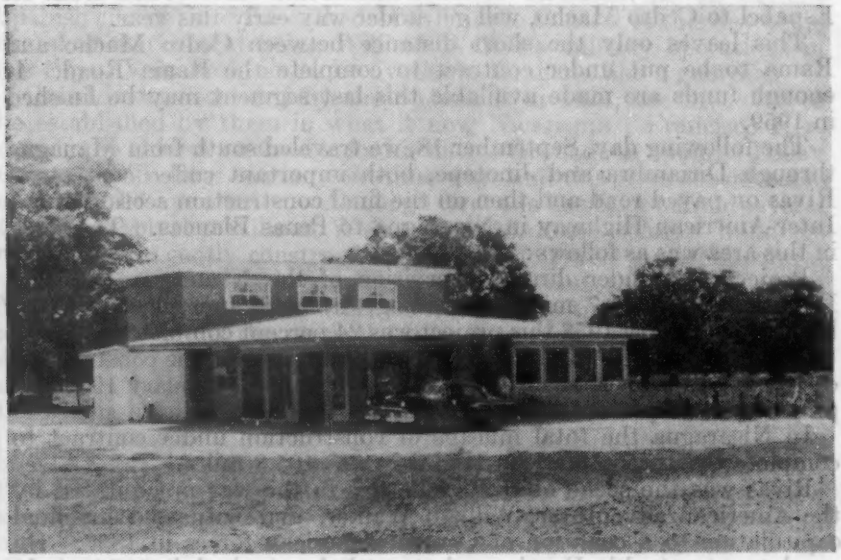
Penas Blancas, heretofore mentioned, is the border point between Nicaragua and Costa Rica. It is really not a town; apart from the respective customs and immigration buildings there is only a small store.

From Penas Blancas to San Ramon we traveled on standard all-weather road; the Costa Rica section of the Inter-American Highway from San Ramon through San Jose to Cartago is paved, and we arrived in San Jose in the early evening of Wednesday, September 18.

Nearly all of the Nicaragua to San Ramon section is in the Province of Guanacaste and among the communities that we passed through en route were La Cruz, Liberia, Bogaces, Las Canas, and Esparta. In some cases the proper statement would be that we passed by.

La Cruz is 12 miles from Penas Blancas and the Inter-American Highway bypasses the town by about a mile. La Cruz is situated on a high bluff overlooking the Bay of Salinas and offers an excellent view of the bay and the Pacific Ocean.

PLATE 7. INTER-AMERICAN HIGHWAY, COSTA RICA.



New Inter-American Drive Inn lunchroom recently built by the highway right-of-way in Costa Rica near the turn off to Liberia about 47 miles from the Nicaragua border; about 1 block away is a recently built modern service station.

Liberia, 47 miles from the Nicaragua border, is the capital of the Province of Guanacaste. Bagaces and Las Canas, like LaCruz, are bypassed by the Inter-American Highway route. The same is true with respect to Esparta in the upper Province of Puntarenas.

The Province of Guanacaste is termed the "Wild West" of Costa Rica. It is the land of colorful cowboys, with their machetes and fringed leather chaps, driving large herds of cattle across the grazing ranges. Their horses are fitted with the finest of saddles and generous adornments from head to tail.

From San Ramon we traveled through Naranjo, Grecia, Alajuela, and Heredia to San Jose. No contracts are involved in the section of the Inter-American Highway extending from San Jose, through Cartago, to San Isidro del General.

San Jose, the national capital, has a population of about 90,000 and is situated in a broad fertile valley of the Meseta Central, 3,870 feet above sea level. It was founded in 1755 but did not become the capital until 1823. Prior to 1823 Cartago, which was the first city founded by the Spaniards in Costa Rica, in 1564, was the capital city.

The principal street in San Jose is Avenida Central, which changes in name to the Paseo Colon, after it leaves the commercial center, in honor of Columbus who discovered Costa Rica in 1502 on his last voyage to the New World. The Paseo Colon connects the city with La Sabana, the national airport which is thus of easy access from the center of the city. Its administration building is considered among the finest interpretations of Spanish and Moorish architectural design in Central America. Increase in air travel has made it necessary to build a larger airport, about 14 miles from San Jose; near the city of Alajuela. The new airport, called El Coco, when completed will be one of the most modern airports in Central America.

Travelers who stop at the Gran Hotel de Costa Rica need only step across the street to visit an edifice of which Costa Ricans are rightfully very proud—the National Theater. This is an artistic jewel and an architectural triumph. Its spacious balconies and staircases of marble, its beautiful statues and its magnificent fresco paintings are the works of noted European artists. The foyer is decorated in gold and adorned with Venetian plate mirrors.

Along Paseo Colon, a modern and well-landscaped boulevard, are many fine residences; this impressive section is comparable to El Prado in Madrid, Spain. The city also has several important parks, including Central Park, Morazon Park with its Temple of Music, Espana Park with its Tree of Central American Brotherhood, Merced Park, Bolivar Park and Zoo, and the National Park with its monument representing the five Central American countries ousting William Walker, the North American adventurer, who unsuccessfully sought to conquer Costa Rica, Nicaragua, and other Central American countries.

With San Jose as your starting point, you can enjoy several trips into the beautiful countryside of the Meseta Central, visiting Cartago and Heredia enroute. Or you may wish to spend some time at one of the beautiful mountain resorts near San Jose, such as La Catalina, where a bit of Switzerland atmosphere is created in Central America, where the scenery is varied and beautiful, and where you may enjoy such recreation as swimming, hunting, and mountain climbing.

CARIBBEAN SEA
PACIFIC OCEAN
GULF OF CHIRIQUI
LAKE NICARAGUA
LA CRUZ
BAGACES
LAS CANAS
SAN RAMON
NARANJO
ALAJUELA
HEREDIA
CARTAGO
SAN JOSE
GRECIA
ESPARTA
GULF OF NICOYA
SAN ISIDRO DEL GENERAL
BUENOS AIRES
PASO REAL
LA CUESTA
GOLFITO
GULF OF DULCE
THE INTER-AMERICAN HIGHWAY IN
COSTA RICA
NOVEMBER 1957
MILES
102
177
134
413
PAVED ROAD
ALL WEATHER (gravel)
IMPASSABLE (Under constr.)
MILES
KILOMETERS

Cartago, with a genuine atmosphere of Colonial Spain, is only 14 miles from San Jose, and you pass through a number of small villages and coffee plantations enroute. The way to Cartago leads along the Orosi Valley. The mission in the town of Orosi is many centuries old and contains numerous fascinating artistic treasures. In a virginal forest beyond the town, the Orosi waterfall drops its spraying water 300 feet. Cartago, although ravaged by earthquakes, still contains early Spanish buildings, but is best renowned for the Church of the Angels, erected on a spot where the Virgin is believed to have presented to a peasant girl a miniature image of herself in black stone that is still preserved. On a Sunday you can see the colorful country folk gather at the Cartago market place, bringing their wares in their gayly painted oxcarts.

From Cartago you can arrange a trip to the volcanoes of Irazu and Turrialba. From the summit of Irazu at 11,322 feet you will witness a panorama of the Central Cordillera, a matchless vista that will remain vivid in your mind so long as you shall live. On a clear day you may see not only Lake Nicaragua a hundred miles away, but also both the Atlantic and Pacific Oceans. You can reach the mouth of Irazu crater by a paved road. This volcano is in constant activity and when one of its frequent eruptions is seen from nearby it presents a most impressive spectacle. The white-capped, semiactive Volcano Turrialba also gives your eyes a memory-lingering treat.

Heredia makes an interesting trip as the tourist may stop at one of the numerous coffee plantations in the area. There you will see for yourself exactly how the red berry on the tree is converted into the coffee bean. Heredia presents a pleasing appearance, reminiscent of southern Spain, with its church towers above red-tiled roofs, iron grilles on windows, and multicolored gardens set among whitewashed adobe walls.

Still another side trip may be to Alajuela, a city famous for its flowers and for its market days when all the oxcarts in the land seem to make this their gathering place. Near Alajuela is Ojo de Agua, a beautiful swimming pool with water clear as crystal. Adjacent to the pool, a waterfall and a cool verdant glen combine to make Ojo de Agua an ideal spot for a relaxing and refreshing swim.

Beyond Heredia and Alajuela there is Volcano Poas (9,000 feet); the Poas crater is one of the world's largest, measuring more than a mile across; within its throat lies a sulfur lake, which, during eruptions, shoots a steaming geyser 2,000 feet upward. Within a few hundred yards of the Poas crater there is a cold-water lake nearly one-half mile in diameter. You can travel by car to a point about 3 miles from the volcano; it is then necessary to proceed on horseback; on foot the going is extremely rough. La Catalina is a picturesque resort built on a coffee estate on the highway leading to Poas Volcano. Excellent facilities are available to the tourist at La Catalina, which has been constructed in the style of the Bavarian Alps and best of all it can be reached from San Jose over a good road in about 30 minutes.

Major construction work is in progress from San Isidro del General to the Panama border to eliminate the lower gap in the Inter-American Highway. Contracts involved at the time of our inspection trip included the following:

Project 5, under Beeche & Fait, Ltd., Cia. Constructora, and Quiros & Ulate, Ltd., contracts for 42.7 miles of grading, drainage,

select material and crushed stone base and the construction of four bridges between San Isidro del General and Platanares.

Project 4, under a Foster-Williams Bros. Co. contract for 59 miles of grading, drainage, select material and crushed stone base and the construction of one bridge between Platanares and Ballast Pit.

Project 6, also under a Foster-Williams Bros. Co. contract for 32.3 miles of grading, drainage, select material and crushed stone base from Ballast Pit to the Panama border.

Plans call for the construction of a total of 46 bridges in the San Isidro del General to Panama section; in September 1957 5 bridges were under contract and 41 bridges were yet to be placed under contract.

New communities will certainly be established along the San Isidro del General-Panama right-of-way when construction is completed. At the present time the principal towns include Volcan, Buenos Aires, Paso Real, Palmar, Golfito, and La Cuesta, the latter in close proximity to the Costa Rica-Panama border.

PLATE 8. INTER-AMERICAN HIGHWAY, COSTA RICA

This steep cut through rock is in the El Cajon section of Costa Rica; this is in the link between Costa Rica and Panama.

Because of the construction situation our method of inspection included both airline and jeep transportation. Early Thursday morning, September 19, we traveled via Lacsa Airlines from San Jose to Palmar, located on the Rio Grande de Terraba in lower Puntarenas Province; from this point we proceeded via jeep up the Rio Grande de Terraba to advanced construction work being done by the Foster-Williams Bros. Co. We then returned to spend the night at the Palmer camp operated by Foster-Williams.

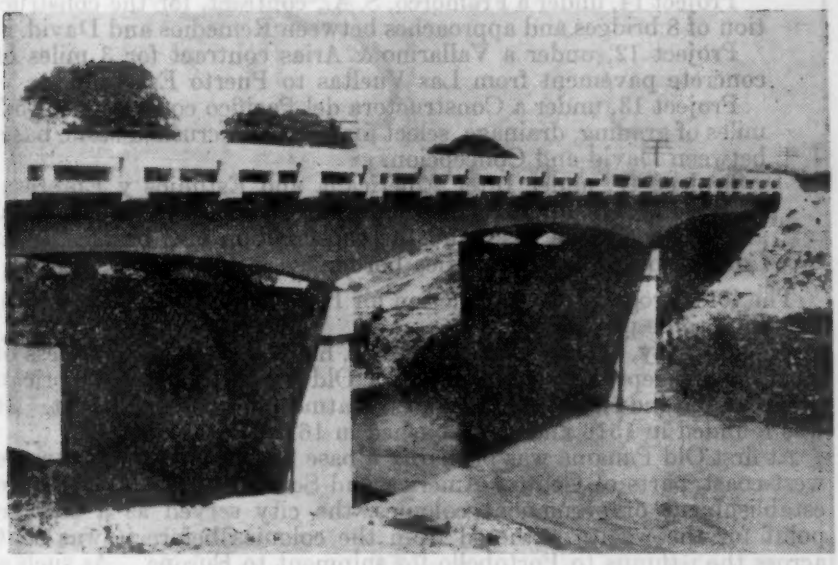
Early the following morning, Friday, September 20, we traveled via a small plane over the entire lower route of the Inter-American

Highway, first south and east to the Panama border and then north and west along the construction route and the Talamanca mountains to San Isidro del General, and continuing on to San Jose. The early morning arrival in San Jose permitted visits with United States Ambassador Robert F. Woodward, President Jose Figares of Costa Rica, and officials of the Costa Rica Department of Public Works during the day and departure that night via Pan American Airways for Panama. This crowded schedule for Friday enabled us to speed up our schedule by 1 day for additional time in Panama and the Panama Canal Zone.

PANAMA

The Republic of Panama has made excellent progress in the development of the Inter-American Highway within its borders. In company with Mr. Porter E. P. Marshall, Chief Engineer, United States Bureau of Public Roads, and Mr. Tomas Guardia, Sr., Chief of the Highway Department of the Republic of Panama, we drove from

PLATE 9. INTER-AMERICAN HIGHWAY, PANAMA



New bridge across Rio Estancia, Panama. This bridge is typical of those now being constructed in the Inter-American Highway program.

Panama City west and north on the Inter-American Highway to inspect road construction in progress.

Tomas Guardia, Sr., is the "Grand Old Man" of roadbuilding in Panama, having been interested in roadbuilding for over 30 years. Almost from memory he can relate details of the construction of any major bridge or section of road built in the Republic of Panama.

The construction program for Panama as of September 1957 included the following:

Project 11, under a Framorco, S. A., contract, for 9.8 miles of crushed-stone base and concrete pavement from Anton to Penonome.

Paving had previously been completed from Panama City through Arraijan, La Chorrera, Chame, and Rio Hato, to Anton.

Project 15, under Framorco, S. A., and Constructora del Pacifico contracts, for 27.3 miles of grading, drainage, select material and crushed-stone base, and the construction of 8 bridges, between Penonome and Aguadulce.

Project 16, under a J. A. Jones Construction Co. contract, for 31.7 miles of grading, drainage, select material and crushed-stone base, and the construction of 5 bridges, between Aguadulce and Santiago.

Our travel followed the construction route to Santiago and we noted that the work was resulting in a well-constructed all-weather road; also that the rainy season was delaying operations on some phases of the work, particularly the construction of the bridge across the Santa Maria River. However, the J. A. Jones Construction Co. was taking full advantage of all workable weather conditions in order to bring the job to completion at the earliest possible date.

In the Remedios-Costa Rica Border section, the program included these contracts:

Project 14, under a Framorco, S. A., contract, for the construction of 8 bridges and approaches between Remedios and David.

Project 12, under a Vallarino & Arias contract for 3 miles of concrete pavement from Las Vueltas to Puerto Escondido.

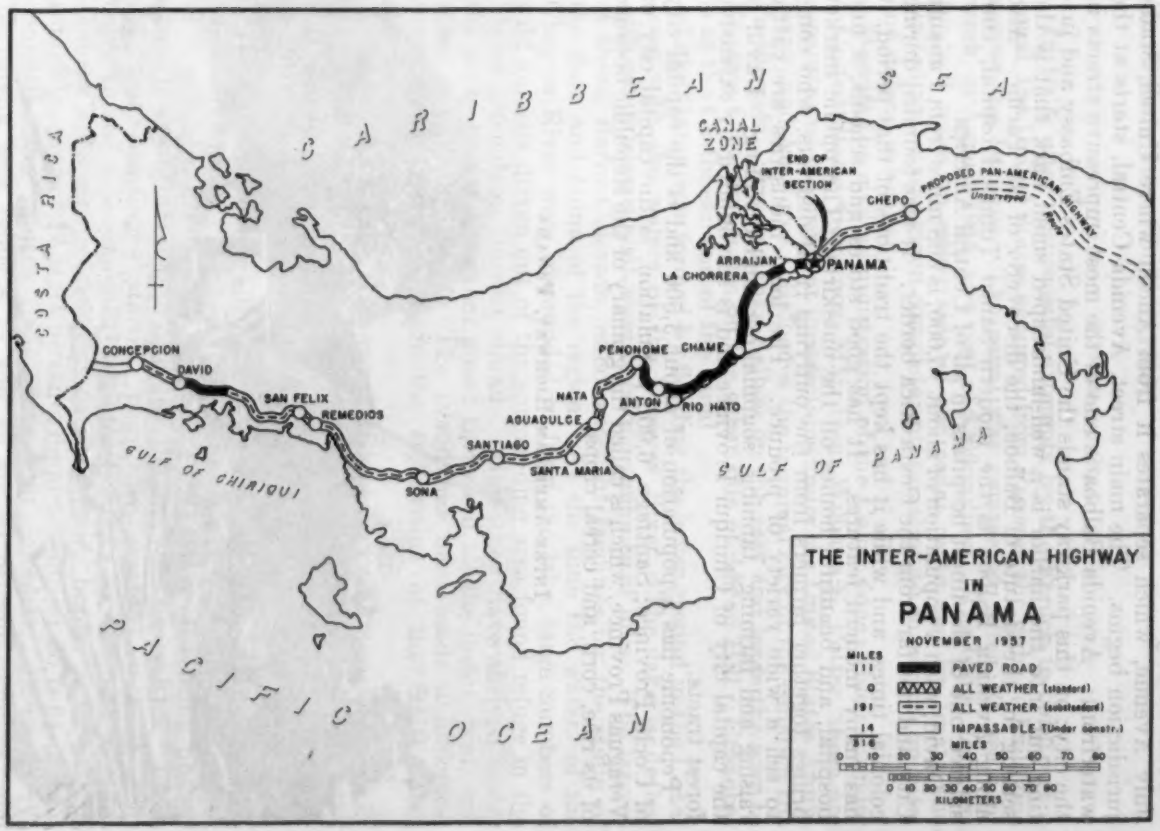
Project 13, under a Constructora del Pacifico contract, for 15.3 miles of grading, drainage, select material and crushed-stone base, between David and Concepcion.

Project 17, under Inter Americana and Estudios y Empresa, S. A., contracts, for 16.8 miles of grading, drainage, select material and crushed-stone base, and the construction of 8 bridges, from Concepcion to the Costa Rica border.

The total program of construction for Panama involved 103.9 miles, including some pavement.

Panama City, capital of the Republic, has a population in excess of 125,000 and represents a blending of Old Spain, modern American progress and industry, and some of the atmosphere of the Orient. It was founded in 1516 and reestablished in 1673.

At first Old Panama was primarily a base for expeditions to various west-coast parts of Central America and South America. With the establishment of permanent colonies, the city served as a storage point for the wealth gathered from the colonies before it was sent across the isthmus to Portobello for shipment to Europe. As such a treasure storehouse, Old Panama naturally attracted the attention of the pirates. Henry Morgan, the English pirate, sacked Old Panama in 1671, and the present city was built in 1673. The tourist in Panama should certainly include a visit to the ruins of Old Panama, where the cathedral tower, which was the most conspicuous landmark of the main plaza, rises in the quiet solitude of the ruined city. Here elaborate ceremonies were celebrated, and legend is to the effect that voyagers on the galleons visiting the isthmus were cheered by the ringing of its sonorous bells which could be heard far out at sea. There are also ruins of houses, bridges, convents, and fragments of walls, and from the substantial nature of the ruins one will readily agree that Old Panama was a city of grandeur and power. In the


CARIBBEAN SEA
COSTA RICA
CANAL ZONE
END OF INTER-AMERICAN SECTION
CHEPO
PROPOSED PAN-AMERICAN HIGHWAY
Under study
ARRAIJAN
PANAMA
LA CHORRERA
CONCEPCION
DAVID
SAN FELIX
REMEDIOS
PENONOME
CHAME
NATA
ANTON
RIO HATO
AGUADULCE
SANTIAGO
SANTA MARIA
SONA
GULF OF CHIRIQUI
GULF OF PANAMA
PACIFIC OCEAN
THE INTER-AMERICAN HIGHWAY
IN
PANAMA
NOVEMBER 1957
MILES
111 PAVED ROAD
0 ALL WEATHER (standard)
191 ALL WEATHER (substandard)
14 IMPASSABLE (Under constr.)
316 MILES
0 10 20 30 40 50 60 70 80
0 10 20 30 40 50 60 70 80
KILOMETERS

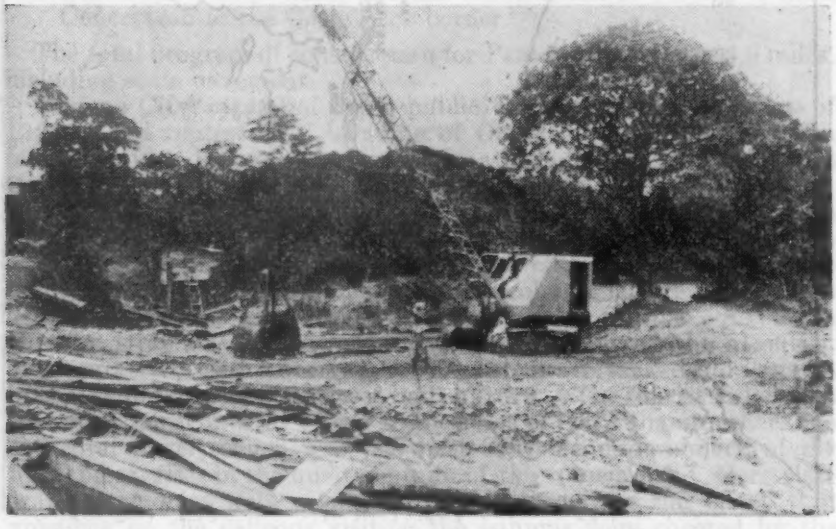
shadows of these majestic ruins, lit by the radiant light of the stars of a tropical sky and amid the mystic silence of their antiquity, one cannot be oblivious to their romantic charm.

Panama City is divided from the Canal Zone by a street, Fourth of July Avenue, which separates it from Ancon where United States jurisdiction begins. The main street, Avenida Central, starts at the waterfront. Avenida Balboa is one of the most impressive streets in the city; on this parkway stands the United States Embassy and jutting out into the harbor is a well-landscaped small park that is the setting for the statute of Balboa, the discoverer of the Pacific. Also along Avenida Balboa is the modern Santo Tomas Hospital, considered one of the finest hospitals in all of Central America.

David, with a population of about 15,000, is 308 miles from Panama City and not far from the Costa Rica border. It was founded during colonial times, and while it has kept the traditions of that period, it has many modern features. It has good stores and schools, a fine hospital, and beautiful homes on the outskirts. The public market brings together farmers from the outlying rural districts, who come to sell a wide variety of produce. The local industries are cattle raising and farming, tanning, soapmaking, and distilling. David is the capital city of Chiriqui Province and is surrounded by extensive forest tracts.

Penonome has a population of about 3,500 and is the capital city of Cocle Province; Santiago, 6,000 population, is the capital city of Veraguas Province, which is called the granary of the Republic because of its rice, corn, and cereal crops.

INTER-AMERICAN HIGHWAY, PANAMA



Bridge construction site with dragline bucket; Rio Grande in Panama.

Nata, with the improvement of the Inter-American Highway, now has a fast expanding dairying industry and has an excellent sugar mill and a large plant for the processing of dairy products and other food products. In this small town is the oldest church in the Western Hemisphere; it was built in 1520.

PANAMA CANAL

In 1903, after unsuccessful attempts by the French to construct a canal, the United States acquired from Panama the right to build one across the Isthmus. The canal was completed, after 10 years of work, in August 1914, at a cost of $366 million. The Canal Zone extends 5 miles on either side of the canal route and by treaty the United States was given complete authorization to construct, operate, and defend the canal.

Besides the civil administration of the Canal Zone, which is under a United States Governor, Maj. Gen. William E. Potter, there are separate and independent jurisdictions under the United States Army, Navy, and Air Force. Balboa is the terminal city of the canal on the Pacific side. Ancon flanks Balboa on the east and leads the way to Panama City, which lies on the other side of Ancon Hill. Cristobal is at the Caribbean end of the canal.

Lake Gatun was formed by flooding the lower ground in the Canal Zone with the waters of the Chagres River. The lake is dotted with small islands that were once the summits of hills. The largest of these, Barro Colorado, offers excellent facilities for the study of the flora and fauna of the region. At the time the waters of the Chagres River were impounded to form the lake, large numbers of wild animals driven out of the surrounding area found refuge in the higher ground on Barro Colorado. Here they have thrived under the protection of laws that guard them and all the insect, bird, and plant life of the island. The island has been made a biological reservation, which is under the supervision of the Smithsonian Institution.

The Inter-American Highway section of the Pan American Highway System officially terminates at Panama City and the Panama Canal.

SUMMARY

We traveled via car all the way from a point near the Guatemala-Mexico border to Panama City, except for the Costa Rica gap south of San Ysidro del General and the Panama segment being pushed westerly through David to complete the link with Costa Rica. From the above-mentioned starting point, we traveled without difficulty to the Guatemala-El Salvador border. At the present time, January 1958, project 16 next to the Mexico border is 99 percent complete; project 17 is 93 percent complete; project 20 is 94 percent complete; and project 19 is 89 percent complete. Down in the Barbarena area projects 24 and 25 are 95 percent complete; and project 21, construction of 3 bridges, is 62 percent complete. The current reports from Guatemala are to the effect that all but about 7 miles are ready for travel and the entire distance will be completed for all-weather travel by the end of 1958.

The route in El Salvador is all paved and kept in good condition.

Most of the 94 miles of Inter-American Highway in Honduras is all-weather and kept in good condition. In Honduras everything is under contract to the paving stage and will be completed in 1958.

Construction work in Nicaragua did not interfere with travel by car from Honduras through to the Nicaragua-Costa Rica border.

We traveled by car from Pinas Blancas, Nicaragua, through to San Jose, Costa Rica, and could have reached San Ysidro del General, a point almost midway between San Jose and the Panama border. We flew over the "under construction" section in Costa Rica in a small plane, from which it could be seen that good progress was being made by the contractors. Much of this entirely new section has now gone beyond the 50 percent completion mark.

Construction in Panama is moving along rapidly with a number of projects completed and the remainder well along. We traveled by air from San Jose to Panama City, thence by car toward the Costa Rica-Panama border. All travel was during the rainy season, but the rains did not interfere with the maintenance of our established schedule.

Unless unexpected difficulties are now encountered the Inter-American Highway should be at a completed all-weather stage ready for hard-surfacing in 1 more year; that is, sometime in 1959.

Travel will be comfortable but not deluxe; that is to say that the Inter-American Highway will be adequate for its traffic volume. There will be a sufficient number of gasoline service stations spaced along the highway to take care of the prudent travelwise motorist and cautious spacing of daily travel terminals will give the motorist good overnight facilities.

Table showing November 1957 status of the Inter-American Highway (prepared by U. S. Bureau of Public Roads)

Project	All-weather			Impassable	Total	Construction		
	Paved	Standard	Substandard			Paved	Active	Scheduled
Guatemala:								
16				18.3	18.3		18.3	
15				6.8	6.8		6.8	
17			44.2		44.2		44.2	
20			25.4		25.4		25.4	
19			42.2		42.2		42.2	
18			38.9		38.9		38.9	
Previous	72.0				72.0	72.0		
24			7.5		7.5		7.5	
26			42.2		42.2		42.2	
25			7.8		7.8		7.8	
Previous	12.0				12.0	12.0		
Subtotal	84.0	0.0	208.2	25.1	317.3	84.0	233.3	0.0
El Salvador: Previous	195.0				195.0	195.0	0.0	0.0
Subtotal	195.0				195.0	195.0	0.0	0.0
Honduras:								
56-1			21.2		21.2		21.2	
		24.0	48.8		72.8			72.8
Subtotal	0.0	24.0	70.0		94.0	0.0	21.2	72.8
Nicaragua:								
4-A		13.3			13.3		13.3	
7-A		21.7			21.7		21.7	
8-A			48.4		48.4		48.4	
Previous	132.0				132.0	132.0		
6-A		7.0	15.2		22.2		22.2	
Subtotal	132.0	42.0	63.6	0	237.6	132.0	105.6	0.0
Costa Rica:								
3	40.2	108.0			148.0		148.0	
Previous	60.0				60.0	60.0		
7		71.0			71.0			71.0
5				42.7	42.7		42.7	
4				59.0	59.0		59.0	
6				32.3	32.3		32.3	
Subtotal	102.0	177.0	0	134.0	413.0	60.0	282.0	71.0
Panama:								
17				14.0	14.0		14.0	
13			15.0		15.0		15.0	
Previous	16.0				16.0	16.0		
12	3.0				3.0	3.0		
18			114.8		114.8			114.8
16			32.9		32.9		32.9	
15			28.2		28.2		28.2	
11	10.1				10.1		10.1	
Previous	82.0				82.0	82.0		
Subtotal	111.1	10.1	190.9	14.0	316.0	101.0	100.2	114.8
Total	624.1	295.1	243.0	173.1	1,572.9	624.1	732.2	216.6

Reduced to a paragraph, as of November 1, 1957, of the 1,573 miles of the Inter-American Highway in Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama—

(1) 624 miles were paved;

(2) 295 miles were standard all-weather;

(3) 243 miles were substandard, but all-weather;

(4) 173 miles were impassable; 25 miles in Guatemala, 134 in Costa Rica, and 14 in Panama; and

(5) 732 miles were under active construction, with 217 more scheduled for construction.

Travel Notes

The motorist intending to travel the Inter-American Highway when completed should:

(1) Very carefully develop his route schedule, especially with respect to road conditions reported to prevail at the time and accommodations reported to be available at the time. More care must be exercised in this matter than is usual with respect to travel in the United States.

(2) Arrange day-by-day travel to allow for a safe maximum of mileage, to assure adequate gasoline and service stops, and to assure arrival at a community affording good hotel or motel accommodations at the end of the day's drive. It is not good judgment to travel after dark; to do so is likely to result in difficulties with respect to overnight accommodations. In a few words, "don't try to go too far too fast."

(3) Ascertain and comply with automobile insurance requirements before crossing into Mexico.

(4) Check all requirements for entry into and exit from all countries through which he expects to travel. The following 1957 table gives a brief outline of these requirements:

Requirements for the entry of United States tourists into the Latin American Republics, 1957

Country	Documents required	Length of stay allowed	Fee for visa or tourist card
Mexico	Tourist card issued by consul, Mexican Government tourist bureaus, or Mexican immigration authorities at points of entry; birth certificate or similar documentary proof of citizenship; smallpox vaccination certificate; 4 photographs (for multiple entry card). NOTE.—A multiple entry card at $5, and good for 180 days may be used as often as desired.	180 days	$3.
Guatemala	Tourist card, issued by consul or transportation company; birth certificate or similar documentary proof of citizenship; smallpox vaccination certificate. NOTE.—Tourist card must be used within 60 days of date of issuance.	180 days (renewable for an additional 180 days).	$2.
El Salvador	Tourist card, issued by consul upon presentation of expired passport, birth, or naturalization certificate; smallpox vaccination certificate; health certificate; police certificate; 1 photograph for application form; round-trip ticket or transportation to another country. NOTE.—Those in possession of a valid passport may secure from consulate a free multiple entry visa, valid for a period of 24 months.	90 days	Free.
Honduras	Passport; visa; smallpox vaccination certificate. NOTE.—Must report to police within 48 hours after arrival and obtain an exit permit before departure from Honduras.	48 months	Free.
Nicaragua	Passport; visa; health certificate; yellow fever certificate; smallpox vaccination certificate; police certificate; 2 photographs.	30 days	Free.
Costa Rica	Tourist card, issued by consul or transportation company; smallpox vaccination certificate; round-trip ticket or transportation to another country. NOTE.—Those in possession of a valid passport can obtain a multiple entry visa free, good for 4 years, instead of tourist card. Tourist card is valid for 90 days from date of issuance.	30 days (renewable for another 60 days).	$2
Panama	Tourist card issued by transportation company; smallpox vaccination certificate; round-trip ticket or transportation to another country; 2 photographs. NOTE.—Those in possession of a valid passport can obtain a tourist visa from consul free of charge.	15 days (may be extended for an additional 15 days).	$1

Prior to completion of the Inter-American Highway it may be that steps will be taken by the various Central American countries to standardize entry and exit requirements to facilitate travel throughout Central America and thereby more readily attract tourist travel.

DARIEN SURVEY

The Inter-American Highway ends at Panama City, but the Republic of Panama has completed an all-weather road eastward from Panama City to Chepo. From this point it is proposed to provide a highway link connecting Chepo with a continuation of the Pan American Highway System in Colombia, South America.

To this end the member nations of the Pan American Highway Congress have joined in establishing the Darien Subcommittee to explore the most feasible routes to accomplish this connection. More

than $80,000 has been contributed toward financing the survey, which is under the direction of Senor Tomas Guardia, Sr., of Panama, chairman of the Darien Subcommittee.

The United States has cooperated in the venture by furnishing technicians and equipment through the Inter-American Geodetic Survey and the regional office for the Inter-American Highway maintained in Panama by the United States Bureau of Public Roads.

The Inter-American Committee of Presidential Representatives, which met in Washington in May 1957, by resolution pointed out that the construction of the section of the Pan American Highway known as the "Darien Bottleneck" is of great importance not only to the Republics of Colombia and Panama but to all the countries of the Americas. At the present time the preliminary work of exploring and surveying the Darien area in Panama and adjacent regions in Colombia is being carried out; once this work is completed, project planning will get under way.

It is significant to note that the Pan American Highway Congress held in Panama in August 1957 recommended that the Governments of Panama and Colombia request the United States to contribute two-thirds of the cost of making the project study of Tapon del Darien; that Panama and Colombia furnish two-thirds of the remaining one-third; and that Mexico and the other countries of Central and South America supply the balance.

The accompanying map shows the area of exploration in the Darien Gap. It is estimated that the cost of making the project study will be about $2 million.

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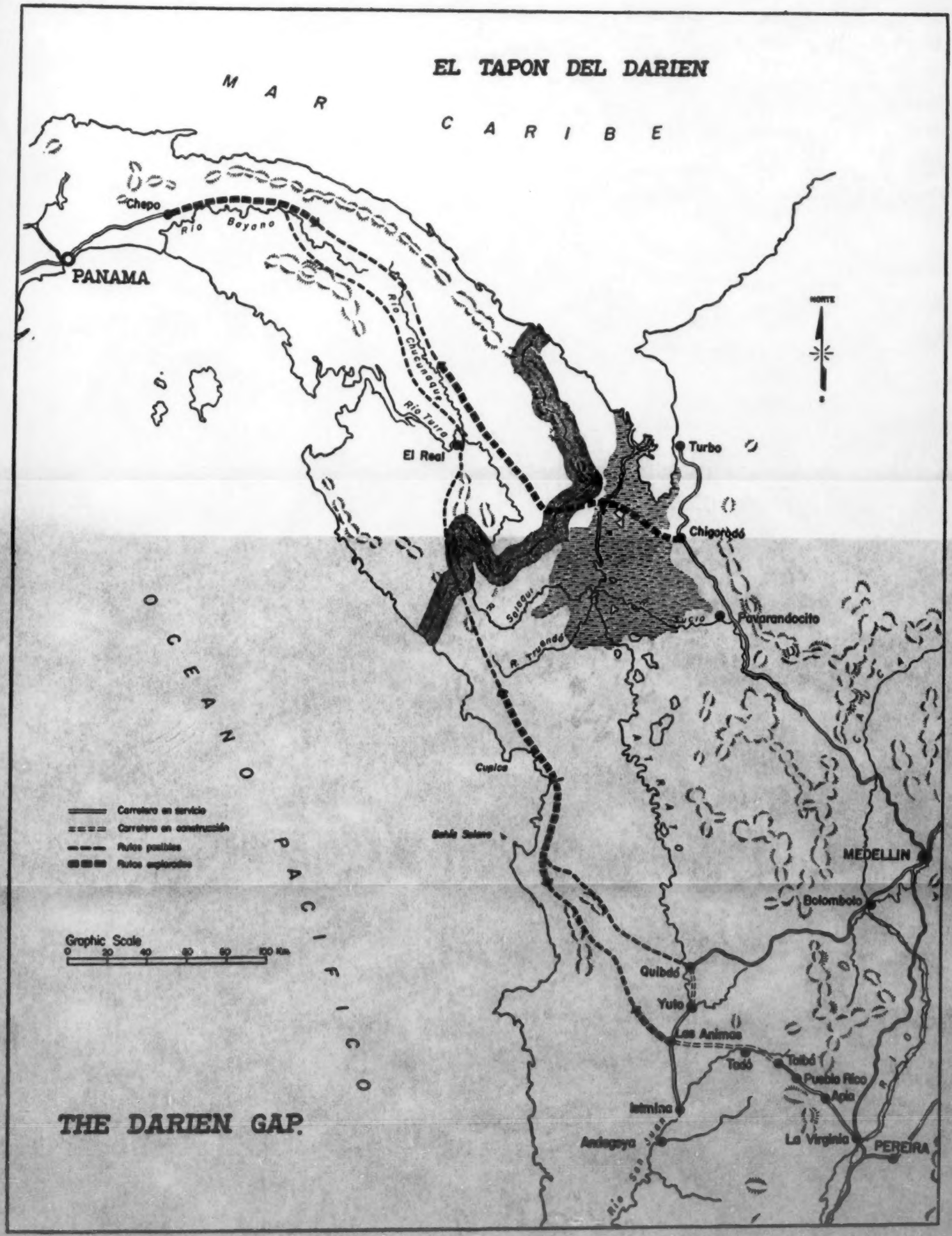
EL TAPON DEL DARIEN
M A R
C A R I B E
Chepo
Río Bayano
PANAMA
Río Chucunaque
Río Tuira
El Real
NORTE
Turbo
Chigorodó
Río Sucio
Río Truandó
Pavarandocito
Cupica
Bahía Solano
O C E A N O P A C I F I C O
Carretera en servicio
Carretera en construcción
Rutas posibles
Rutas exploradas
Graphic Scale
0 20 40 60 80 100 Km.
MEDELLIN
Bolombolo
Quibdó
Río Atrato
Yuto
Las Animas
Tadó
Istmina
Andagoya
Río San Juan
Pueblo Rico
Apia
La Virginia
PEREIRA
THE DARIEN GAP.